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Summary of U.S. Observer Sampling of Foreign and Joint Venture Fisheries in the Northeast Pacific Ocean and Eastern Bering Sea, 1985

by

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March 1987

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The year 1985 was the ninth year that foreign and joint venture fisheries operated under the Magnuson Fishery Conservation and Management Act (MFCMA) of 1976 which requires foreign vessels to accept observers. In 1985, the Northwest and Alaska Fisheries Center sent 421 U.S. fisheries observers to sample aboard Japanese, Soviet, Polish, Republic of Korea, Taiwanese, and Portuguese vessels involved with either foreign directed fisheries or as joint venture processing ships in fisheries conducted with U.S. fishermen. The purposes of placing observers on foreign and joint venture fishing vessels within the U.S. 200-mile exclusive economic zone (EEZ) were (1) to collect data that could be used to estimate the foreign and joint venture commercial catches; (2) to determine the incidental catch of species whose retention is prohibited by U.S. regulations; (3) to provide information needed to assess the biological status of the various stocks of fish; and (4) to report on suspected violations of U.S. fishing regulations.

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SUMMARY OF U.S. OBSERVER SAMPLING OF
FOREIGN AND JOINT VENTURE FISHERIES
IN THE NORTHEAST PACIFIC OCEAN
AND EASTERN BERING SEA, 1985

by

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A. INTRODUCTION

The year 1985 was the ninth year that foreign and joint venture fisheries operated under the Magnuson Fishery Conservation and Management Act (MFCMA) of 1976 which requires foreign vessels to accept observers. In 1985, the Northwest and Alaska Fisheries Center sent 421 U.S. fisheries observers to-sample aboard Japanese, Soviet, Polish, Republic of Korea, Taiwanese, and Portuguese vessels involved with either foreign directed fisheries or as joint venture processing ships in fisheries conducted with U.S. fishermen., (See Table A1, at the back of this section, for a description of the various vessel types and a listing of vessel class abbreviations which are used in tables in the remainder of this paper.) The MFCMA requires all foreign vessels to have an observer aboard during fishing operations (except in approved situations). In 1985, overall observer coverage of the total number of foreign vessel-days on grounds ($100 \times \text{observer days/foreign vessel days}$) was 89%. This represented 21,998 days in which observers actually sampled aboard foreign vessels which spent a total of 24,739 vessel days on the fishing grounds in the Bering Sea, Gulf of Alaska, and off the Washington, Oregon, and California coasts.

The purposes of placing observers on foreign and joint venture fishing vessels within the U.S. 200-mile exclusive economic zone (EEZ) were 1) to collect data that could be used to estimate the foreign and joint venture commercial catches; 2) to determine the incidental catch of species whose retention is prohibited by U.S. regulations; 3) to provide information needed to assess the biological status of the various stocks of fish; and 4) to report on suspected violations of U.S. fishing regulations.

The information obtained by observers included the location, duration, average depth, and catch weight of each trawl haul or longline set made while the observer was aboard. Observers on motherships recorded the noon (Greenwich mean time) position of the processing ship and the tonnage caught by the type of catcher boat. In addition, each observer sampled several hauls or portions of the longline set each day to determine species composition by weight, the incidence in the catch of those species whose retention is prohibited by U.S. regulations, and the age and length composition of designated species in the catch. Upon return to Seattle, observers also submitted reports of any suspected violations of U.S. regulations as well as descriptions of fishing strategy and sampling methods used.

OBSERVER SAMPLING PROCEDURES

The sampling procedures used by observers in 1985 have been described by Nelson et al. (1981) and French et al. (1981). While on the vessel, the observer determined the species composition of the catch by taking representative basket samples of various trawl hauls or portions of a longline set. Individuals of each species in the samples were then counted and weighed. If the catch on a stern trawler or joint venture processing ship was composed of a high percentage of one species, the observer often determined the composition of the entire haul by separating, counting, and weighing all non-target species. The weight of the target species was

calculated by subtracting the weight of the other species from the total haul weight. The numbers of the target species were obtained by dividing the total weight of the species by the average weight per fish determined from a sample of the catch. For those species for which additional biological information was desired, length frequencies were taken from random samples, and otoliths or scales were taken from subsamples stratified by length and sex. Observers monitored the catch being emptied from fish holding bins via conveyor belts, watched the emptying of nets or the landing of the longline catch, and recorded the number of salmon (Oncorhynchus spp.), Pacific halibut (Hippoglossus stenolepis), Tanner crab (Chionoecetes spp.), and king crab (Paralithodes and Lithodes spp.) per unit weight of catch. These species have been designated as prohibited species and as such, U.S. regulations prohibit the retention of the incidental catch of these species. Observers also collected data on the sightings and incidental catch of marine mammals, the design and dimensions of fishing gear, and methods of fish processing, and at times did other special studies. Upon return to Seattle, the data were keypunched for computer analysis.

METHODS OF CALCULATION

Estimates of Foreign and U.S. Joint Venture Catches

Estimates of the foreign catches were based on observer and foreign reported data using the method previously described by Nelson et al. (1981). In this technique,, the average daily catch rates of each species by vessel class (obtained by observers for the vessels sampled) for a particular statistical reporting area were applied to the total number of vessel days on the grounds in that area. Refer to Figure 1 of each section for the boundaries and designations of the statistical reporting areas of each region. Data on fleet vessel days on the grounds were obtained from the foreign vessel check-in and check-out summaries which are required by U.S. regulations and are verified by Coast Guard surveillance flights and ship patrols. In a very few instances during 1985, observer coverage of a given week-area-vessel class element was less than 20%. In these cases, it was thought that estimates based solely on the existing observer data might not be representative of the total foreign fishing in that element. In order to provide a "best estimate," the U.S. estimates were used when observer coverage of a week-area-vessel class element was at least 20% and when the U.S. estimate of the catch differed by more than 10% from the foreign-reported catch for that element. Catches reported by foreign vessels were used for those elements which did not meet both of the above criteria.

It was not feasible to estimate the catch of U.S. joint ventures in exactly the same way as the foreign fisheries, due to unequal and constantly fluctuating numbers of catcher boats delivering fish to the processing vessels. When observers were present on 20% or more of the processing ships in a particular element, the percent species composition of the catch by weight, as determined by observer sampling, was applied to the sum of the total catch weights reported by the processing vessels. If there was less than 20% observer coverage of the joint venture processing fleet for that week-area, or when the estimates at the 20% or greater coverage level differed by less than 10%, the foreign reported catch by species was used.

Estimates of Incidental Catches and Average Weights of Pacific Salmon, Pacific Halibut, Snow (Tanner) Crab, and King Crab

The mean incidence (number of individuals caught per metric ton (t) of groundfish catch), and the total incidental catch (numbers and tonnage) of Pacific salmon, Pacific halibut, snow (Tanner) crab, and king crab in the 1985 foreign and joint venture groundfish fisheries were estimated from U.S. observer data. The incidental catches, in numbers, of these species were estimated by multiplying the average monthly incidence rates for each nation, area, and vessel class by the estimated monthly groundfish catches for those same nations, areas, and vessel classes. Incidental catch by weight was calculated by multiplying the estimated numbers of fish or crab caught each month by the average weight per individual (kg) determined from observer samples for that same data element. In instances where monthly incidence data were not available for a particular nation, area, or vessel class, mean quarterly or annual rates from those same areas or vessel classes were applied to monthly groundfish catches. In cases where no sampling was conducted by observers during the year, the incidental catch was estimated by using data collected from another nation, vessel class, or area which was judged to have a similar fishing operation.

Estimates of Rockfish and Flatfish Catch by Species

Estimates of the foreign and joint venture catches of rockfish and flatfish by species were made by applying the mean annual species composition (percentage by weight) computed from samples collected by U.S. observers to the total rockfish and flatfish catch. Specific catch allocations were set for yellowfin sole (Limanda aspera) in the Bering Sea and Pacific ocean perch (Sebastes alutus) off the Washington-Oregon-California coast; therefore, the "best estimates" of catch were used for those species in those regions. In cases where no species composition data were collected, a judgment was made as to whether data from another nation, area, or vessel class would best reflect the expected composition of the catch of flatfish or rockfish for the data element in question. All observers were trained in species identification and instructed in the use of fish identification keys but errors in the identification of some species could have been made.

Table A1.--Definition of foreign vessel classes used by U.S. observer program in the Bering Sea/Aleutian Islands and North Pacific groundfish fishery.

| Vessel Class | Abbreviation | Definition |
|----------------------------|--------------|--|
| Mothership - Surimi | SMS | Mothership fleets with capacity to produce surimi (a minced fish product), frozen products, and meal. |
| Mothership - Freezer | FMS | Mothership fleets with capacity to produce frozen products and/or meal. |
| Mothership - Joint Venture | JVM | Mothership fleets where the catcher boat fleet is composed of U.S. trawlers and the mothership is of foreign registry. Fish caught are defined as U.S. landings. |
| Small Stern Trawler | SST | Independent stern trawlers less than 1500 gross registered tons (GRT). |
| Large Freezer Trawler | LFT | Independent stern trawler 1500 GRT or greater, with capacity to produce frozen products and/or meal. |
| Large Surimi Trawler | LST | Independent stern trawler 1500 GRT or greater, with capacity to produce surimi, frozen products, and meal. |
| Longliner | LL | Independent vessels fishing with baited longline gear. |

B. SUMMARY OF OBSERVER SAMPLING FOR THE BERING SEA/ALEUTIAN ISLANDS REGION

OBSERVER COVERAGE OF FISHING FLEETS

During 1985, foreign vessels from Japan, the U.S.S.R., Poland, and the Republic of Korea fishing on foreign quotas spent 12,446 vessel days in the U.S. 200-mile EEZ in the Bering Sea/Aleutian Islands region (Table B1). This level of effort was 33% lower than that used in 1984 (Berger et al., 1985). United States fisheries observers spent 11,120 days sampling aboard these foreign vessels resulting in an observer coverage (100 x number of observer days/number of foreign vessel days) of 09.3%. The comparative level of observer coverage in 1984 was 81.9% (Berger et al., 1985).

While foreign effort devoted to fishing on foreign quotas decreased in 1985, the effort of foreign vessels participating in joint ventures with U.S. catcher vessels increased 120%. Foreign vessels spent 7,307 days in joint venture fishing operations. These joint ventures were conducted between U.S. vessels and processing vessels from the U.S.S.R., Japan, Poland, the Republic of Korea, Taiwan, and Portugal. The 6,340 days spent by observers aboard the foreign processing vessels in joint venture fisheries provided an observer coverage of 85.8%.

A total of 17,460 of the 19,833 vessel days (foreign and joint venture fisheries combined) were sampled by observers in 1985, making an overall percent coverage of 88.0. This level of coverage was 7% greater than the percent observer coverage of the Bering Sea fleets achieved in 1984.

ESTIMATES OF FOREIGN AND U.S. JOINT VENTURE CATCHES

The estimated foreign catch of groundfish in 1985 was approximately 1.035 million t (Table B2). Walleye pollock (Theragra chalcogramma) made up the dominant portion of the total catch (79.3%). The combined catches of the three categories of flatfish--yellowfin sole, turbot (Reinhardtius and Atheresthes spp.), and other flatfishes--accounted for 14.3% of the catches, and Pacific cod (Gadus macrocephalus) made up 5.5%. As in previous years, Japanese vessels landed the largest portion of the catch, 74.9%; ships from the Republic of Korea took 20.9%; Polish vessels caught 3.1%; and ships from the U.S.S.R. landed 1.0%.

United States vessels delivered over 639,400 t of groundfish to foreign processing vessels in the 1985 joint venture fisheries. walleye pollock (59.0%), yellowfin sole (19.8%), other flatfishes (7.2%), Pacific cod (6.5%), and Atka mackerel (Pleurogrammus monopterygius, 5.9%) were the five major species groups targeted on in the joint venture operations.

Table B3 presents a summary of the foreign and joint venture catches by species for the years 1977 to 1985. The 1985 total foreign catch of about 1.035 million t represents a 13.2% decrease from the 1984 estimated catch of 1.192 million t. The U.S. joint venture landings continued the steady increase in size they have experienced since the beginning of that fishery in 1980. The 1985 joint venture catch estimate of 639.4 thousand t represents an increase of

79% over the 1984 figure of 357.5 thousand t. The catch of pollock in the joint venture fisheries increased from 237.0 thousand t in 1984 to 377.5 thousand t in 1985, but accounted for a smaller portion of the total catch (59.0%) in 1985 as compared to 1984 (66.3%). A larger catch of yellowfin sole was made in 1985 (126.4 thousand t), which accounted for 19.8% of the total catch versus a catch of 32.8 thousand t or 9.2% of the total catch in 1984.

INCIDENCE AND INCIDENTAL CATCH OF PROHIBITED SPECIES

Incidence rates of salmon, halibut, Tanner crab, and king crab for all the statistical reporting areas were calculated as described in the introduction section. In addition, incidence rates were also calculated for the triangular area labelled "outside FCZ" (fisheries conservation zone) in Figure B1. In recent years, pelagic trawling for pollock has occurred in this area, and at times observers have been aboard and sampled the catches. As the area is outside U.S. jurisdiction, no data are available on vessel days on the grounds, thus total catch estimates for this area can not be calculated. Incidental catch rate data for this region are included in the tables for informational purposes only.

Pacific Salmon

The incidence rates and average weights of salmon taken in the catches sampled by observers are shown in Table B4. Incidence rates were very low in 1985, exceeding 0.1 salmon/t only five times. Polish large freezer trawlers targeting on pollock in December caught 0.799 salmon/t in Area I, and 0.340 salmon/t in Area II. Also in December, Japanese large surimi trawlers and Republic of Korea small trawlers caught 0.564 salmon/t and 0.116 salmon/t in Area I, respectively. United States joint venture operations with the Republic of Korea caught 0.116 salmon/t in Area I in February. The highest annual incidence rate (0.039 salmon/t) occurred in the Polish large freezer trawler fishery for pollock in Area IV.

The incidence of salmon by vessel class, quarter, and 1/2° latitude by 1° longitude statistical area is illustrated in Figures B2-85. Small stern trawlers had only one occurrence of incidence rates greater than one salmon/t (55°00' N lat., 165° W long. in the third quarter). Large surimi trawlers had two occurrences of incidence rates greater than 0.5 salmon/t: in the third quarter at 58°30' N latitude, 177° W longitude and in the fourth quarter at 57°30' N latitude, 172° W longitude. Large freezer trawlers had two occurrences of incidence rates greater than one salmon/t: in the first quarter at 56°30' N latitude, 167° W longitude and in the fourth quarter at 56°00' N latitude, 171° W longitude. Aside from these, there were no other occurrences of salmon incidence rates which exceeded 0.5 salmon/t in foreign catches made by small trawlers (Fig. B2), large surimi trawlers (Fig. B3), or large freezer trawlers (Fig. B4). Salmon incidence rates were very low aboard joint venture vessels (Fig. B5), with no occurrences of rates greater than 0.5 salmon/t.

Table B5 presents the estimated incidental catches of salmon by nation, area, and vessel class. In 1985, foreign vessels caught 10,003 salmon incidental to the groundfish fishery. Interceptions of salmon by Japanese ships were estimated to have remained at about the same level as in 1984 (7,300 fish in 1984, 7,450 fish in 1985). Most of the salmon (5,600 fish) were taken by large surimi trawlers. The overall reduction in the salmon catch was due to the decreased salmon catches by Republic of Korea large freezer trawlers, Polish large freezer trawlers, Soviet large freezer trawlers, and the departure of the West German large freezer trawler in 1985. These reductions were due to decreased groundfish catches and decreased incidence rates. Joint venture fisheries had an estimated incidental catch of 10,420 salmon in 1985.

The estimated 1985 incidental catch of salmon in the foreign fishery was about 10,000 fish or 33 t (Table B6). The catch of salmon has declined steadily since 1980, and this is the lowest estimated catch for all years from 1977 through 1985. Also, in 1985, the estimated incidental catch of salmon in the joint venture fisheries reversed the trend of increased incidental catches of salmon, and decreased 85% to 10,420 fish. As in 1984, the 1985 U.S.-Japan joint venture operations in Area I accounted for most of the salmon caught by the joint ventures. However, a thirteenfold reduction in annual incidence rates (from 0.356 salmon/t to 0.026 salmon/t) accounted for the substantial reduction in total salmon catch. In the fisheries where high incidental catches of salmon had previously been observed, fishing occurred in the same general locations and at the same times of the year, but salmon were not encountered with the same frequency as in the previous 2 years. The total salmon interception (foreign and joint venture fisheries combined) of 20,423 fish was the lowest number caught since the implementation of the MFCMA in 1977.

The species composition, sex composition, average weight, and average length of the salmon in the incidental catch are given in Table B7. Four species of salmon were represented in the catches taken on foreign vessels. Chinook salmon (Oncorhynchus tshawytscha) composed 70.7% of the foreign incidental catch, chum salmon (O. keta) made up 29.0%, and coho salmon (O. kisutch) and sockeye salmon (O. nerka) together comprised 0.3%. Five salmon species were observed in the joint venture catches: chum salmon, 73.9%; chinook salmon, 24.2%; coho salmon, 1.1%; sockeye salmon, 0.6%; and pink salmon (O. gorbuscha), 0.2%.

Pacific Halibut

Table B8 lists the incidence rates and average weights of halibut in foreign and joint venture catches by nation, vessel class, area, and month. In the foreign fishery, the highest annual average incidence rates were observed on Japanese longline vessels fishing for Pacific cod in waters shallower than 500 m in Areas IV (20.664 halibut/t), I (10.125 halibut/t) and II (5.521 halibut/t). The only other annual average incidence rate greater than 1.0 halibut/t was observed in Area I on Japanese small stern trawlers (1.831). In the joint venture fisheries, the highest observed annual incidence rate of halibut, 4.333 fish/t, occurred in the U.S.-Portugal joint venture conducted

in Area I. Other high rates of halibut incidence in the joint venture fisheries occurred in the U.S.-Taiwan joint venture in Area I (4.164 fish/t) and the U.S.-U.S.S.R. joint venture in Area I (1.607 fish/t).

Figures B6, B7, and B8 illustrate the incidence of halibut by vessel type, quarter, and $1/2^\circ$ latitude by 1° longitude areas. High incidence rates of 10 halibut/t or greater were observed on small stern trawlers (Fig. B6) in the first quarter ($56^\circ00'$ - $57^\circ00'$ N lat., 167° W long.), second quarter ($58^\circ30'$ N lat., 173° W long.), third quarter (outside of Bristol Bay at $57^\circ30'$ - $58^\circ30'$ N lat., 159° - 162° W long.), and fourth quarter ($58^\circ30'$ N lat., 167° W long.). Incidental catch rates of 1.0 halibut/t to 5.0 halibut/t were commonly observed on small stern trawlers throughout the year along the continental slope and on the continental shelf. Incidental catch rates of halibut on large surimi and large freezer trawlers were generally less than 1.0 halibut/t. Incidental catch rates exceeding 5.0 halibut/t were commonly observed on longline vessels throughout the year (Fig. B7). The incidence of halibut frequently exceeded 10 halibut/t during the first and fourth quarters on longline vessels fishing along the continental slope between 167° - 175° W longitude. In the joint venture fisheries (Fig. B8), halibut incidence rates of 10 halibut/t or greater were observed in the third quarter ($56^\circ30'$ N lat., 158° W long. and at $58^\circ00'$ N lat., 162° W long.) and in the fourth quarter ($56^\circ00'$ N lat., 161° - 163° W long., and at $57^\circ00'$ N lat., 169° - 171° W long.).

Increases in the estimated catch of halibut (Table B9) in the Japanese longline fisheries offset a large part of the decreases experienced in almost all of the other fisheries, the net result being 485,000 halibut caught in 1985 compared to 518,000 caught in 1984. An increased emphasis in 1985 on shallow-water longline fishing in the Bering Sea for Pacific cod was primarily responsible for the larger numbers of halibut taken by longline vessels. Decreased catches of groundfish were responsible for the decreased catches of halibut by the trawl fleets, and generally lower incidence rates were responsible for the decreased catches of halibut by the surimi motherships.

Most of the estimated catches of halibut in the joint venture fisheries were taken in the U.S.-U.S.S.R., U.S.-Japan, and U.S.-Republic of Korea operations targeting on flatfish (including yellowfin sole), Pacific cod, and pollock in Area I. About 45,000 halibut were estimated to have been taken in the U.S.-Republic of Korea Area I joint venture in 1985 (a 5% decrease from 1984). The U.S.-U.S.S.R. Area I fishery took an estimated incidental catch of about 259,100 halibut in 1985, which is an 83.8% increase in catch from the estimated 141,000 landed in 1984. In 1985, higher incidental catch rates in May to August and a three-fold increase in groundfish catch for the year accounted for this increase. In 1985, the U.S.-Japan joint venture operations greatly increased their targeting effort on flatfish. This was responsible for the rise in halibut catches from 3,400 fish in 1984 to 109,400 in 1985.

The total estimated catch of halibut taken incidentally in the foreign and joint venture fisheries increased 21%, from about 773,000 halibut in 1984 to about 933,000 in 1985 (Table B10). The estimated catch of halibut in the foreign fisheries decreased about 6% (from about 518,300 in 1984 to 485,300 in 1985), whereas the estimated halibut catch in the joint venture fisheries increased almost 76% (from approximately 254,300 in 1984 to 447,400 in 1985).

The overall average size of halibut was 71.5 cm (4.9 kg) in the foreign directed trawl fisheries, 65.3 cm (3.1 kg) in the longline fishery, and 56.6 cm (2.5 kg) in the joint venture fisheries.

Tanner Crab

The incidence and average weights of Tanner crab observed in the foreign and joint venture fisheries in 1985 are summarized in Table B11 by nation, vessel class, month, and area. The highest annual incidence rates in the foreign fishery were observed in catches landed on Japanese small trawlers in Area I (11.019 crab/t) and Area II (7.194 crab/t), on Japanese large freezer trawlers in Area I (8.495 crab/t) and Area II (100.692 crab/t in a small fishery which only caught a total of 364.4 t of groundfish), and on Japanese longline vessels fishing in water shallower than 500 m in Area II (3.176 crab/t). In the joint venture fisheries, the highest average rates were observed in the joint venture fisheries in Area I by Taiwan (6.276 crab/t), the U.S.S.R. (3.071 crab/t), and the Republic of Korea (2.727 crab/t).

High rates of incidence of Tanner crab (10.0 crab/t or greater) were observed throughout 1985 in catches made by small stern trawlers along the continental slope (54°00' to 61°00' N lat. by 166° to 180° W long.) (Fig. B9). On large freezer trawlers (Fig. B10), occurrences of Tanner crab greater than 25 crab/t were found in the first quarter (57°00'-58°00' N lat., 166°-168° W long.) and second quarter (57°30' N lat., 164° W long.). During the third and fourth quarters, rates greater than 10 crab/t were observed on large freezer trawlers on the continental slope. Incidence rates of Tanner crab between 1.0 crab/t and 10.0 crab/t were common in the joint venture fishery during the second, third, and fourth quarters (Fig. B11). Incidence rates exceeding 25 crab/t in the joint venture fishery were seen in the third quarter (57°00' N lat., 169° W long. and at 58°30' N lat., 169° W long.) and fourth quarter (57°00' N lat., 167° W long. and at 57°00' N lat., 169° W long.).

The 1985 catch of Tanner crab was down 54% from 1984 for Japanese small trawlers and 95% for Soviet large freezer trawlers but was offset by estimated increases in the incidental catches taken by Japanese longliners (up 190%), Republic of Korea large freezer trawlers (up 38%), Japanese joint ventures (61,455 crab in 1984 to 200,156 crab in 1985; up 226%), Republic of Korea joint ventures (84,393 crab in 1984 to 173,987 crab in 1985; up 106%), and the Soviet joint venture (287,759 crab in 1984 to 513,698 crab in 1985; up 79%) (Table B12). The decreases for Japanese small stern trawlers and Soviet large freezer trawlers were due to lower groundfish catches in 1985. The increases for the Japanese longliners and Republic of Korea large freezer trawlers were due to higher catch rates; the increases for Japanese joint venture operations were due to the shift of some of their fishing effort to the yellowfin sole and flounder fishery and an associated increase in the incidence of Tanner crab. The increased numbers for the Republic of Korea and Soviet joint venture operations were due to higher groundfish catches in 1985.

The 1985 estimated incidental catches of Tanner crab decreased from those of 1984 in the foreign fishery, but increased in the joint venture fishery (Table B13). In the foreign fishery the estimated number of crab decreased from about 2.6 million to 1.8 million, a decrease of 31%, and in the joint

venture operations the catch increased 104%, from 436,900 to 891,400. The total 1985 Tanner crab incidental catch (foreign and joint venture fisheries combined) of 2.7 million crab represents a drop of 300,000 crab or 10% from 1984 and is the second lowest estimated catch for all years from 1977 through 1985.

Table B14 gives the species composition, sex composition, average weight, and average carapace width of Tanner crab observed in the foreign and joint venture groundfish fisheries. Four species of Tanner crab were observed in the foreign directed fisheries: Chionoecetes opilio, C. bairdi, C. angulatus, and C. tanneri. Chionoecetes opilio made up the largest percentage of the incidental catch, 65.4%; C. bairdi was next in importance, composing 19.6% of the catch by number; and C. angulatus and C. tanneri made up 12.9% and 2.1%, respectively. In the joint venture fishery, C. bairdi (60.8%) and C. opilio (39.0%) together comprised almost the entire incidental Tanner crab-catch (C. tanneri (0.2%) and C. angulatus (0.02%) were found in small numbers). The species C. tanneri and C. angulatus are normally found in deeper water than the other two species, and are most often encountered in the catches of small stern trawlers and longline vessels.

King Crab

Table B15 lists the observed incidence rates and average weights of king crab in foreign and joint venture groundfish catches by nation, vessel class, area, and month. The highest incidence rates of king crab were observed on Japanese small stern trawlers, Soviet large freezer vessels, and on vessels participating in the fisheries for yellowfin sole, Pacific cod, and other flatfishes. The annual average incidence rates of king crab for Japanese small trawlers were 1.365 crab/t in Area I and 1.006 crab/t in Area II. Soviet large freezer trawlers involved in the yellowfin sole fishery had an annual average rate of 5.073 crab/t in Area I. The U.S.-U.S.S.R., U.S.-Republic of Korea, and U.S.-Taiwan joint ventures operating in Area I had annual average incidence rates of 3.313 crab/t, 4.614 crab/t, and 2.177 crab/t, respectively. The U.S.-Japan joint venture had an average annual incidence rate of 0.458 crab/t in Area I, but in May and June, when flatfish was the main target, the incidence rates were 2.941 crab/t and 3.131 crab/t, respectively.

Figures B12, B13, and B14 chart the observed incidence rates of king crab in catches made by small stern trawlers, large freezer trawlers, and joint venture vessels by quarter and 1/2° latitude by 1° longitude areas. High rates (5.0 crab/t or greater) were observed in small stern trawler catches (Fig. B12) in the Bristol Bay region (57°00' to 58°30' N lat., 160° to 165° W long.) during the second, third, and fourth quarters. High rates were also observed in various locations along the continental slope during these same periods. Catches exceeding 5 crab/t were reported aboard large freezer trawlers (Fig. B13) in the first quarter at 57°00' N latitude, 159° W longitude and 57°30'-58°30' N latitude, 163° W longitude, and in the second quarter at 58°00' N latitude, 163° W longitude. In the joint venture fisheries, incidence rates exceeding 5.0 crab/t occurred throughout the Bristol Bay region (55°30'-58°30' N lat., 158°-164° W long.) (Fig. B14). There were also several areas of high incidence observed during the first quarter (55°30'-56°00' N lat., 162°-163° W long.) and the fourth quarter (56°30'-57°30' N lat., 162°-164° W long.).

Table B16 gives the 1985 estimated incidental king crab catch by nation, vessel class, and area. In comparison with 1984 figures, the 1985 incidental catch of king crab increased substantially on Republic of Korea and Soviet large freezer trawlers, and decreased substantially on Japanese small stern trawlers and large freezer trawlers. The decrease for Japanese small stern trawlers was due to the decreased groundfish catch made by these vessels. The decreased crab catch aboard Japanese large freezer trawlers was due to decreased catch rates. The increased crab catch experienced by Republic of Korea and Soviet 'large freezer trawlers was due to an increased incidence of king crab catches made by these vessels. The Soviets targeted on yellowfin sole in January and February and had substantially higher catch rates of king crab than in 1984 when their only foreign fishing activity occurred from September to December. The incidence of king crab aboard Republic of Korea large freezer trawlers was similar to that observed on Republic of Korea vessels in 1983. The net result for the foreign fisheries was a decreased catch of king crab: 219,800 in 1985 vs. 292,200 in 1984.

The joint venture operation targeting on yellowfin sole, Pacific cod, and other flatfishes in the Bristol Bay region was estimated to have taken 99.96% of the king crab caught by the 1985 joint venture fisheries. The estimated numbers of king crab taken by the Japanese, Republic of Korea, Soviet, and Taiwanese joint venture operations in Area I increased 153% from those of 1984 (from 397,600 to 1,004,550). Joint venture groundfish catches of yellowfin sole, Pacific cod, and other flatfishes in Area I increased 182% from 1984 to 1985. The increase in groundfish catch and not an increased incidence of crab accounted for the increased numbers of king crab caught in 1985.

The 1985 estimated incidental catches of king crab in the foreign fisheries decreased 25% from that of 1984 to 219,783, the lowest total catch since the implementation of the MFCMA in 1977 (Table B17). In the joint venture fishery, the estimated number of king crab taken incidentally increased 152% from about 398,900 to 1,005,300. The total 1985 king crab incidental catch (the estimated numbers taken by foreign and joint venture fisheries combined) amounted to an estimated 1,225,100 crab, which represents a 77% increase from 1984. The 1985 incidental king crab catch is the third highest catch by number but only the fifth highest catch by weight since 1977.

In the Bristol Bay joint venture fishery, red king crab (Paralithodes camtschatica) is the species of king crab that is taken incidentally, and composed nearly all (99.29%) of the king crab caught by joint venture fisheries in 1985 (Table B18). Red king crab also accounted for most (77.4%) of the incidental king crab taken by the foreign directed fishery, but golden king crab (Lithodes aequispina; 19.7%) blue king crab (P. platypus; 2.2%) and couesi king crab (L. couesi; 0.7%) each made up a higher percentage of the king crab catch than in the joint venture fishery. Table B18 also gives the sex composition, average weight, and average carapace length for the king crab observed in the foreign and joint venture fisheries.

ROCKFISH CATCH BY SPECIES

Table B19 lists the common and scientific names of 21 species of rockfish that were identified by observers as appearing in foreign or joint venture catches in the Bering Sea/Aleutian Islands region during 1985. In this table

and Table B20, the group "other rockfish" consists of 12 species which make up a relatively minor percentage of the rockfish catch.

Approximately 118 t of rockfish were taken in the foreign fishery in 1985, and about 463 t in the joint venture fishery (Table B20). The 1985 foreign rockfish catch represents a decrease of 87% from the 1984 estimated catch of 918 t, and is a decrease of 94% since 1983. The joint venture catch of rockfish decreased 26% from a catch of 622 t in 1984, but is still an increase of 219% since 1983.

Four species of rockfish made up the greatest portion (87.45%) of the rockfish catch taken by foreign vessels: Pacific ocean perch, shortspine thornyhead, shortraker rockfish, and roughey rockfish. Pacific ocean perch was the most frequently taken species in Areas I and II, and comprised 30.2% of the total rockfish catch. Shortspine thornyhead comprised 25.05% of the catch, shortraker rockfish made up 18.6%, and roughey rockfish accounted for 13.6%.

Ninety-two percent of the joint venture catch of rockfish occurred in Area IV. Pacific ocean perch accounted for the largest portion of the catch (53.2%). Northern rockfish was the second species of importance (42.8%).

FLATFISH CATCH BY SPECIES

Twenty-three species of flatfish were identified by observers in groundfish catches made by foreign and joint venture vessels in 1985 (Table B21). In the 1985 foreign fishery, yellowfin sole and Greenland turbot together composed 78.2% of the total estimated catch of flatfish (Table B22). Yellowfin sole, which was the target species of a freezer mothership fishery and of small stern trawlers and large freezer trawlers, composed 77.8% of the estimated flatfish catch in Area I where about 127,600 t of flatfish were caught. Greenland turbot composed 57.0% and 64.1% of the flatfish catches taken in Areas II and IV, respectively. Greenland turbot was targeted on by many small stern trawlers and at times by longline vessels.

Essentially all (99.8%) of the flatfish catch taken by joint venture fisheries in 1985 was landed in Area I. Yellowfin sole and rock sole were the predominant species taken, accounting for 73.3% and 15.8% of the catch in Area I, and 73.2% and 15.9% of the catch overall. Yellowfin sole was the target species of joint venture operations conducted in the Bristol Bay region in Area I, but rock sole was an important secondary species.

Table Bl.--Annual summary of observer effort, foreign and joint venture effort, and observer coverage (100 x observer days/foreign vessel days) by nation and vessel class in the Bering Sea/Aleutian Islands region, 1985.

| Nation | Vessel Class | No. of observers | No. of ships observed | No. of ships in fishery | No. of observer days | No. of vessel days | Percent coverage |
|-------------------------------|-----------------------|---------------------|-----------------------------|-------------------------------|----------------------------|--------------------------|---------------------|
| Japan | Surimi mothership | 20 | 5 | 5 | 543 | 574 | 94.6 |
| | Freezer mothership | 4 | 1 | 1 | 126 | 127 | 99.2 |
| | Small stern trawler | 122 | 51 | 51 | 3,704 | 4,015 | 92.3 |
| | Large surimi trawler | 50 | 15 | 15 | 1,638 | 1,775 | 92.3 |
| | Large freezer trawler | 8 | 2 | 2 | 295 | 314 | 93.9 |
| | Longline | 75 | 22 | 22 | 1,467 | 1,844 | 79.6 |
| | Snailpot | 2 | 1 | 1 | 58 | 59 | 98.3 |
| | Total | | 97 | 97 | 7,831 | 8,708 | 89.9 |
| Republic of Korea (ROK) | Small stern trawler | 13 | 4 | 4 | 316 | 360 | 87.8 |
| | Large freezer trawler | 86 | 23 | 23 | 2,071 | 2,364 | 87.6 |
| | Total | | 27 | 27 | 2,387 | 2,724 | 87.6 |
| Poland | Large freezer trawler | 40 | 27 | 27 | 651 | 740 | 88.0 |
| U.S.S.R. | Large freezer trawler | 6 | 9 | 10 | 251 | 274 | 91.6 |
| TOTAL - FOREIGN FISHERY | | | 160 | 161 | 11,120 | 12,446 | 89.3 |
| U.S.-Japan | Joint Venture | 38 | 29 | 29 | 2,035 | 2,183 | 93.2 |
| U.S.-ROK | Joint Venture | 49 | 22 | 23 | 1,352 | 1,642 | 82.3 |
| U.S.-Poland | Joint Venture | 14 | 9 | 10 | 269 | 324 | 83.0 |
| U.S.-Portugal | Joint Venture | 1 | 1 | 1 | 35 | 36 | 97.2 |
| U.S.-Taiwan | Joint Venture | 4 | 3 | 3 | 43 | 68 | 63.2 |
| U.S.-U.S.S.R. | Joint Venture | 64 | 30 | 30 | 2,606 | 3,134 | 83.2 |
| TOTAL - JOINT VENTURE FISHERY | | | 94 | 96 | 6,340 | 7,387 | 85.8 |
| GRAND TOTAL | | 402* | 254 | 257 | 17,460 | 19,833 | 88.0 |

*This column does not add up because several observers sampled on more than one vessel type.

Table B2.--The estimated catches of groundfish taken by foreign and joint venture vessels in the Bering Sea and Aleutian Islands region in 1985¹.

| Species | Foreign catches (metric tons) | | | | | | U.S. Joint ventures | |
|-----------------------------------|-------------------------------|-------------------|--------|--------|-----------|---------|---------------------|---------|
| | Japan | Republic of Korea | Poland | USSR | Total | Percent | Metric tons | Percent |
| Squid | 1,470 | 15 | 103 | 1 | 1,588 | 0.2 | 31 | <0.1 |
| Yellowfin sole | 59,460 | 33,041 | <1 | 8,205 | 100,706 | 9.7 | 126,407 | 19.8 |
| ^{3/} Turbots | 20,414 | 894 | 2 | <1 | 21,312 | 2.1 | 457 | 0.1 |
| Other flatfishes | 15,362 | 9,638 | 8 | 620 | 25,628 | 2.5 | 45,882 | 7.2 |
| Pollock | 620,112 | 166,606 | 32,061 | 1,504 | 820,283 | 79.3 | 377,540 | 59.0 |
| Pacific cod | 51,975 | 4,885 | 29 | 288 | 57,177 | 5.5 | 41,272 | 6.5 |
| Sablefish | 257 | 53 | 2 | <1 | 312 | <0.1 | 110 | <0.1 |
| Atka mackerel | 1 | <1 | <1 | 0 | 1 | <0.1 | 37,859 | 5.9 |
| ^{4/} Ocean perch spp. | 58 | 9 | 7 | <1 | 74 | <0.1 | 446 | 0.1 |
| Other rockfishes | 42 | 1 | 1 | 0 | 44 | <0.1 | 17 | <0.1 |
| ^{5/} Pacific herring | 1,386 | 92 | <1 | <1 | 1,478 | 0.1 | 3,059 | 0.5 |
| Other fish | 4,768 | 1,476 | 5 | 34 | 6,283 | 0.6 | 6,343 | 1.0 |
| Snails | 104 | 0 | 0 | 0 | 104 | <0.1 | 0 | 0.0 |
| Total | 775,410 | 216,709 | 32,219 | 10,652 | 1,034,990 | | 639,422 | |
| Percent | 74.9 | 20.9 | 3.1 | 1.0 | | | | |

1/ See text for description of the technique used to estimate non-U.S. and joint venture catches.

2/ In 1985, joint venture fisheries were conducted between U.S. catcher boats and processing vessels from Japan, the Republic of Korea, Poland, Taiwan, the U.S.S.R., and Portugal.

3/ Turbots include Greenland turbot (Reinhardtius hippogloissoides), arrowtooth flounder (Atheresthes stomias), and Kamchatka flounder (A. evermanni).

4/ Ocean perch spp. includes Pacific ocean perch, Sebastes alutus; northern rockfish, S. polyspinis; roughey rockfish, S. aleutianus; shortraker rockfish, S. borealis; and sharpchin rockfish, S. zacentrus.

5/ Non-U.S. groundfish vessels were not allowed to retain Pacific herring in 1985.

Table B3.--Estimated catches of groundfish (1,000s t) taken by the foreign and joint venture fisheries in the Bering Sea/Aleutian Islands region, 1977-B5^{1/}.

| Fisheries/ species group | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|--|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| -----Foreign directed catches (metric tons)----- | | | | | | | | | |
| Pollock | 978.4 | 979.4 | 944.0 | 1,006.1 | 986.9 | 959.3 | 891.5 | 933.0 | 820.3 |
| Pacific cod | 35.9 | 47.4 | 41.4 | 37.3 | 39.1 | 28.2 | 41.5 | 58.5 | 57.2 |
| Sablefish | 4.6 | 2.0 | 2.2 | 2.4 | 3.0 | 3.8 | 3.2 | 1.9 | 0.3 |
| Atka mackerel | NA | 24.2 | 23.3 | 20.2 | 18.1 | 7.4 | 1.2 | 0.1 | <0.1 |
| All rockfish | 10.8 | 7.5 | 7.2 | 8.5 | 7.3 | 4.9 | 2.0 | 0.9 | 0.1 |
| Yellowfin sole | 0.3 ^{2/} | 110.3 | 101.1 | 77.8 | 81.3 | 76.0 | 85.9 | 126.8 | 100.7 |
| Turbots and other flatfish | 136.4 ^{2/} | 125.5 | 90.0 | 88.5 | 91.9 | 79.3 | 80.3 | 59.3 | 46.9 |
| Pacific herring | 19.3 | 8.4 | 7.5 | 0.8 | 0.3 | 1.9 | 1.4 | 1.3 | 1.5 |
| Other fish | 94.7 | 71.8 | 64.7 | 47.0 | 39.4 | 22.3 | 14.3 | 7.5 | 6.3 |
| Squid | 8.4 | 9.4 | 7.0 | 6.4 | 5.9 | 5.0 | 4.0 | 3.1 | 1.6 |
| Snails | 0.4 | 2.2 | 0.5 | 0.1 | 0.2 | 0.2 | 0.3 | 0.2 | 0.1 |
| TOTAL | 1,289.1 | 1,385.5 | 1,288.9 | 1,295.1 | 1,273.4 | 1,188.4 | 1,125.5 | 1,192.7 | 1,035.0 |
| -----Joint venture catches (metric tons)----- | | | | | | | | | |
| Pollock | | | | 10.7 | 42.1 | 54.6 | 149.0 | 237.0 | 377.5 |
| Pacific cod | | | | 8.5 | 9.2 | 13.6 | 14.4 | 30.8 | 41.3 |
| Sablefish | | | | <0.1 | 0.2 | 0.1 | 0.1 | 0.3 | 0.1 |
| Atka mackerel | | | | 0.3 | 1.6 | 12.5 | 10.5 | 35.9 | 37.9 |
| All rockfish | | | | 0.1 | <0.1 | <0.1 | 0.1 | 0.6 | 0.5 |
| Yellowfin sole | | | | 9.6 | 16.0 | 17.4 | 22.5 | 32.8 | 126.4 |
| Turbots and other flatfish | | | | 2.8 | 6.0 | 9.2 | 11.8 | 17.4 | 46.3 |
| Pacific herring | | | | 0.0 | 0.0 | <0.1 | 1.1 | 1.8 | 3.1 |
| Other fish | | | | 0.7 | 3.4 | 1.1 | 1.6 | 2.6 | 6.3 |
| Squid | | | | 0.0 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Snails | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTAL | | | | 32.6 | 78.5 | 108.6 | 211.2 | 359.3 | 639.4 |

1/ Statistics for 1977-84 from Berger et al., 1986.

2/ Japan reported yellowfin sole combined with other flounders.

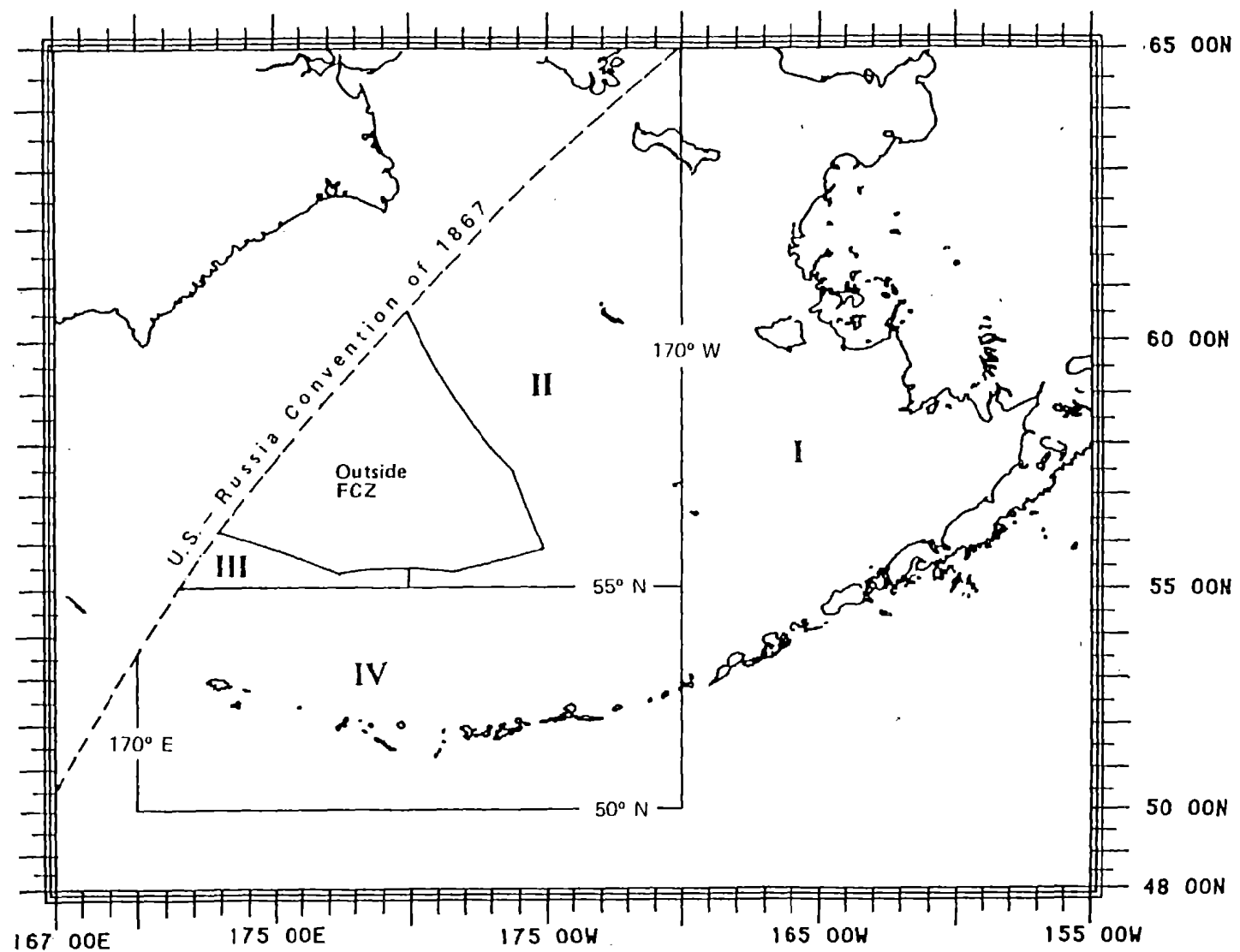


Figure B1.--U.S. statistical areas in the Bering Sea/Aleutian Islands region used to summarize catch and effort data.

Table B4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Surimi Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | NS | NS | 0.001 | 4.661 | -- | -- | -- | -- |
| AUG. | -- | -- | <0.001 | 5.118 | -- | -- | -- | -- |
| SEPT. | -- | -- | 0.008 | 3.082 | -- | -- | -- | -- |
| OCT. | -- | -- | 0.005 | 2.990 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | NS | NS | 0.003 | 3.157 | -- | -- | -- | -- |
| -----Japanese Freezer Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| AUG. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table 84.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Small Trawler----- | | | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | 0.001 | 3.500 | 0.000 | 0.000 |
| FEB. | -- | -- | 0.000 | 0.000 | <0.001 | 1.120 | 0.000 | 0.000 |
| MARCH | 0.000 | 0.000 | 0.002 | 1.331 | 0.002 | 1.393 | 0.004 | 1.700 |
| APRIL | 0.000 | 0.000 | <0.001 | 8.800 | -- | -- | 0.000 | 0.000 |
| MAY | 0.000 | 0.000 | 0.001 | 4.966 | -- | -- | -- | -- |
| JUNE | 0.008 | 3.118 | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | 0.022 | 3.374 | 0.001 | 0.700 | -- | -- | -- | -- |
| AUG. | 0.004 | 4.090 | 0.001 | 0.800 | -- | -- | -- | -- |
| SEPT. | 0.018 | 4.011 | 0.004 | 3.873 | -- | -- | -- | -- |
| OCT. | 0.002 | 3.629 | 0.022 | 3.930 | -- | -- | -- | -- |
| NOV. | 0.003 | 4.438 | 0.024 | 5.796 | -- | -- | -- | -- |
| DEC. | 0.003 | 6.023 | 0.079 | 3.464 | <0.001 | 2.790 | -- | -- |
| ANNUAL | 0.009 | 3.870 | 0.010 | 4.544 | <0.001 | 1.932 | <0.001 | 1.700 |
| -----Japanese Large Freezer Trawler----- | | | | | | | | |
| JAN. | 0.000 | 0.000 | 0.043 | 2.850 | 0.000 | 0.000 | 0.000 | 0.000 |
| FEB. | 0.001 | 1.750 | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| APRIL | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.010 | 5.393 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.003 | 7.400 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| DEC. | 0.001 | 1.515 | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.001 | 4.722 | 0.005 | 2.850 | 0.000 | 0.000 | 0.000 | 0.000 |

*Exclusive Economic Zone

Table B4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Surimi Large Trawler----- | | | | | | | | |
| JAN. | -- | -- | 0.025 | 3.748 | -- | -- | 0.007 | 1.608 |
| FEB. | -- | -- | 0.093 | 3.100 | -- | -- | 0.010 | 2.273 |
| MARCH | -- | -- | 0.034 | 3.067 | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | 0.086 | 2.740 | -- | -- | -- | -- | -- | -- |
| JULY | 0.005 | 1.500 | 0.001 | 3.450 | -- | -- | -- | -- |
| AUG. | 0.004 | 4.000 | 0.002 | 2.213 | -- | -- | -- | -- |
| SEPT. | 0.018 | 3.658 | 0.019 | 4.334 | -- | -- | -- | -- |
| OCT. | 0.025 | 3.467 | 0.026 | 4.063 | -- | -- | -- | -- |
| NOV. | 0.041 | 3.135 | 0.037 | 4.161 | -- | -- | -- | -- |
| DEC. | 0.564 | 1.776 | 0.026 | 4.146 | 0.001 | 2.800 | -- | -- |
| ANNUAL | 0.035 | 3.089 | 0.026 | 3.938 | 0.001 | 2.800 | 0.008 | 1.940 |
| -----Japanese Longliners Fishing <500 M----- | | | | | | | | |
| JAN. | NS | NS | 0.000 | 0.000 | -- | -- | -- | -- |
| FEB. | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| MARCH | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| APRIL | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| MAY | NS | NS | NS | NS | NS | NS | -- | -- |
| JUNE | -- | -- | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | -- | -- | NS | NS | -- | -- | -- | -- |
| AUG. | -- | -- | 0.004 | 2.000 | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | 0.000 | 0.000 | NS | NS | -- | -- |
| NOV. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| DEC. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| ANNUAL | 0.000 | 0.000 | <0.001 | 2.000 | 0.000 | 0.000 | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Longliners Fishing >500 M----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | 0.000 | 0.000 | -- | -- |
| ANNUAL | -- | -- | -- | -- | 0.000 | 0.000 | -- | -- |
| -----U.S.S.R. Large Freezer Trawler----- | | | | | | | | |
| JAN. | 0.002 | 5.712 | -- | -- | -- | -- | -- | -- |
| FEB. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.002 | 5.712 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

Table B4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Polish Large Freezer Trawler----- | | | | | | | | |
| JAN. | 0.051 | 1.966 | 0.024 | 3.455 | 0.072 | 2.712 | 0.017 | 2.260 |
| FEB. | -- | -- | 0.000 | 0.000 | -- | -- | 0.005 | 2.345 |
| MARCH | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | 0.040 | 0.120 | -- | -- | NS | NS | -- | -- |
| NOV. | 0.008 | 3.766 | -- | -- | 0.010 | 2.713 | -- | -- |
| DEC. | 0.799 | 0.846 | 0.340 | 3.190 | 0.037 | 2.747 | 0.000 | 0.000 |
| ANNUAL | 0.022 | 1.974 | 0.019 | 3.439 | 0.039 | 2.733 | 0.009 | 2.285 |
| -----Republic of Korea Small Trawler----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | NS | NS | 0.000 | 0.000 | -- | -- |
| MARCH | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| APRIL | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| MAY | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| JUNE | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| AUG. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.008 | 3.514 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.016 | 3.781 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.002 | 5.000 | -- | -- | -- | -- | -- | -- |
| DEC. | 0.116 | 3.279 | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.009 | 3.574 | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Republic of Korea Large Freezer Trawler----- | | | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | -- | -- | 0.007 | 3.635 |
| FEB. | NS | NS | 0.000 | 0.000 | <0.001 | 1.200 | 0.000 | 0.000 |
| MARCH | 0.001 | 2.200 | 0.017 | 2.250 | -- | -- | -- | -- |
| APRIL | 0.000 | 0.000 | 0.001 | 1.700 | -- | -- | -- | -- |
| MAY | 0.000 | 0.000 | 0.008 | 2.644 | -- | -- | -- | -- |
| JUNE | 0.001 | 4.793 | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | 0.002 | 4.150 | 0.003 | 5.300 | -- | -- | -- | -- |
| AUG. | <0.001 | 4.300 | -- | -- | -- | -- | -- | -- |
| SEPT. | <0.001 | 2.764 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.023 | 3.524 | 0.000 | 0.000 | -- | -- | -- | -- |
| NOV. | 0.005 | 2.746 | 0.000 | 0.000 | -- | -- | -- | -- |
| DEC. | 0.001 | 6.113 | 0.050 | 3.056 | -- | -- | -- | -- |
| ANNUAL | 0.005 | 3.521 | 0.006 | 3.392 | <0.001 | 1.200 | 0.006 | 3.635 |
| -----U.S.-U.S.S.R. JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | 0.051 | 4.806 | -- | -- | -- | -- | -- | -- |
| MARCH | 0.030 | 2.700 | -- | -- | -- | -- | -- | -- |
| APRIL | 0.005 | 5.919 | -- | -- | 0.000 | 0.000 | -- | -- |
| MAY | 0.000 | 0.000 | -- | -- | 0.001 | 2.450 | -- | -- |
| JUNE | <0.001 | 4.570 | -- | -- | 0.001 | 1.700 | -- | -- |
| JULY | <0.001 | 2.800 | -- | -- | 0.000 | 0.000 | -- | -- |
| AUG. | 0.015 | 4.617 | -- | -- | -- | -- | -- | -- |
| SEPT. | <0.001 | 3.688 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.039 | 2.845 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.007 | 4.040 | -- | -- | <0.001 | 2.000 | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Republic of Korea JV Mothership----- | | | | | | | | |
| JAN. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| FEB. | 0.116 | 3.047 | -- | -- | -- | -- | -- | -- |
| MARCH | 0.000 | 0.000 | -- | -- | 0.098 | 2.330 | -- | -- |
| APRIL | 0.009 | 6.298 | -- | -- | 0.005 | 2.895 | -- | -- |
| MAY | 0.008 | 2.874 | NS | NS | 0.008 | 2.134 | -- | -- |
| JUNE | 0.007 | 3.633 | -- | -- | 0.001 | 2.833 | -- | -- |
| JULY | 0.005 | 3.513 | 0.000 | 0.000 | 0.012 | 2.396 | -- | -- |
| AUG. | 0.005 | 3.716 | NS | NS | -- | -- | -- | -- |
| SEPT. | 0.038 | 2.294 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.017 | 2.791 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.007 | 5.000 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.015 | 3.134 | 0.000 | 0.000 | 0.006 | 2.326 | -- | -- |
| -----U.S.-Japan JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | 0.005 | 2.493 | -- | -- | -- | -- | -- | -- |
| APRIL | 0.009 | 3.019 | -- | -- | -- | -- | -- | -- |
| MAY | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| JUNE | 0.004 | 2.656 | 0.002 | 2.838 | -- | -- | -- | -- |
| JULY | 0.004 | 2.610 | 0.005 | 14.584 | -- | -- | -- | -- |
| AUG. | 0.056 | 2.455 | 0.037 | 2.363 | -- | -- | -- | -- |
| SEPT. | 0.092 | 2.823 | 0.012 | 4.825 | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.026 | 2.641 | 0.005 | 3.638 | -- | -- | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table 84.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|-------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Poland JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | 0.085 | 3.303 | -- | -- | -- | -- | -- | -- |
| MAY | 0.015 | 3.593 | -- | -- | -- | -- | -- | -- |
| JUNE | 0.026 | 3.095 | -- | -- | -- | -- | -- | -- |
| JULY | 0.020 | 3.143 | -- | -- | 0.003 | 3.142 | -- | -- |
| AUG. | 0.074 | 2.917 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.026 | 1.812 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.006 | 0.100 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.011 | 3.300 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.035 | 2.883 | -- | -- | 0.003 | 3.142 | -- | -- |
| -----U.S.-Taiwan JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | 0.006 | 2.523 | -- | -- | -- | -- | -- | -- |
| JULY | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| AUG. | 0.008 | 2.700 | -- | -- | -- | -- | -- | -- |
| SEPT. | NS | NS | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.006 | 2.597 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Portugal JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | 0.013 | 4.925 | -- | -- | -- | -- | -- | -- |
| MARCH | 0.066 | 3.816 | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.030 | 4.130 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

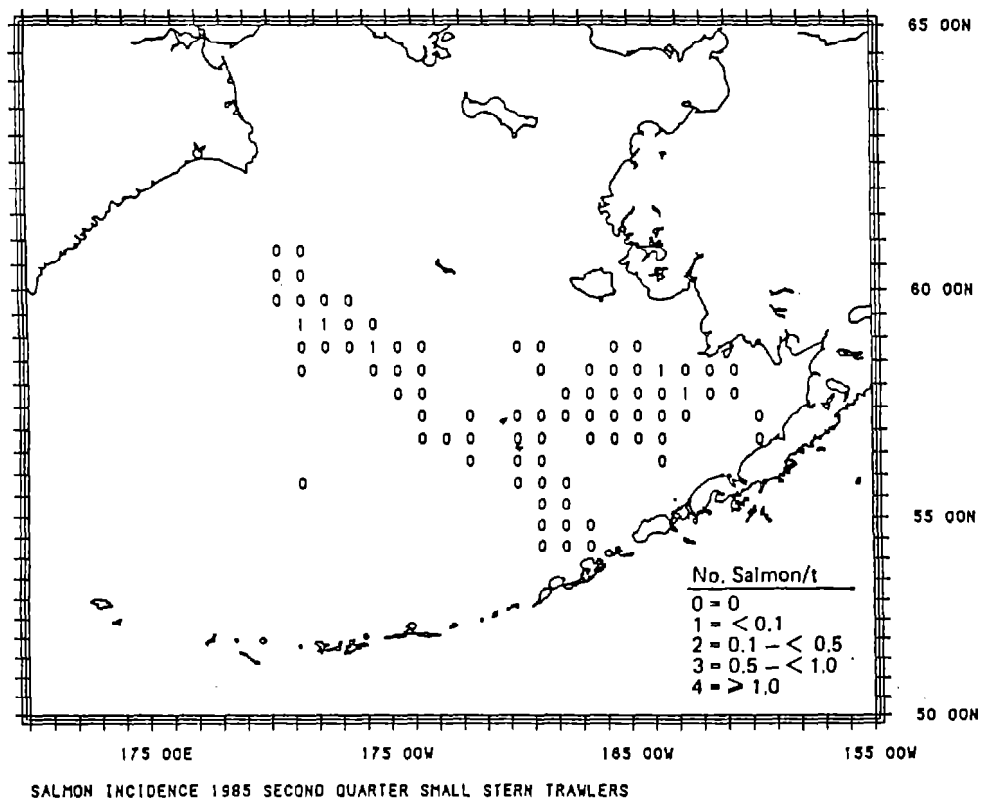
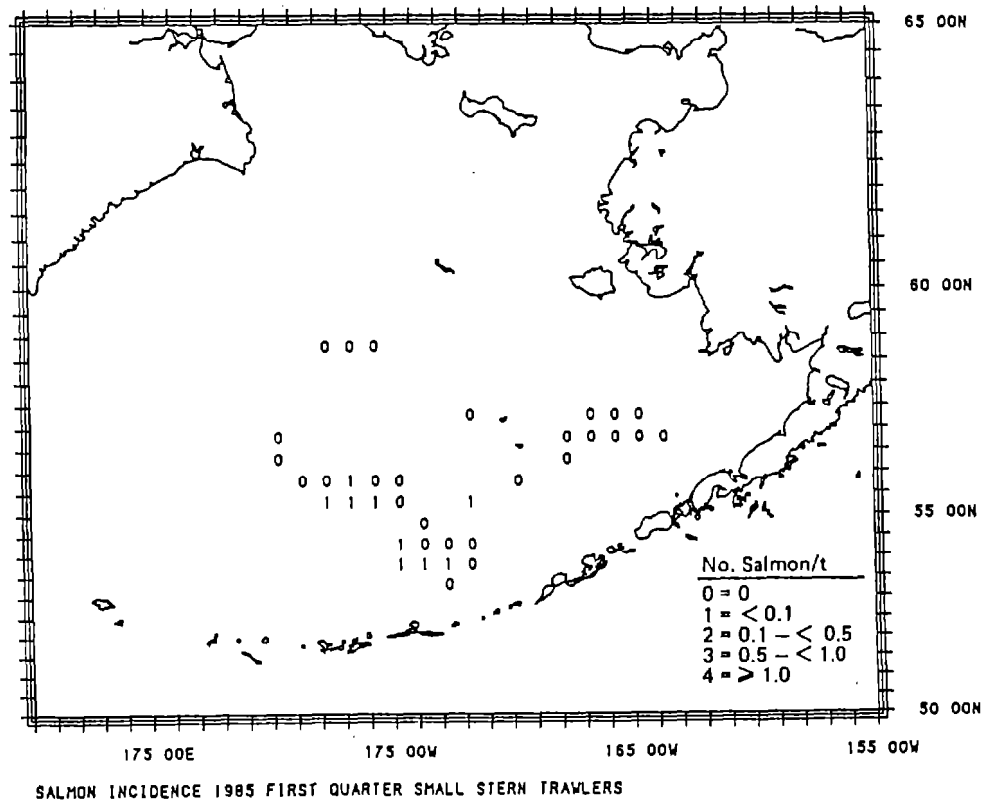


Figure B2. --Average incidence (no./t) of salmon on small stern trawlers (all nations) by quarter and 1/2° lat. by 1° long. areas, 1985.

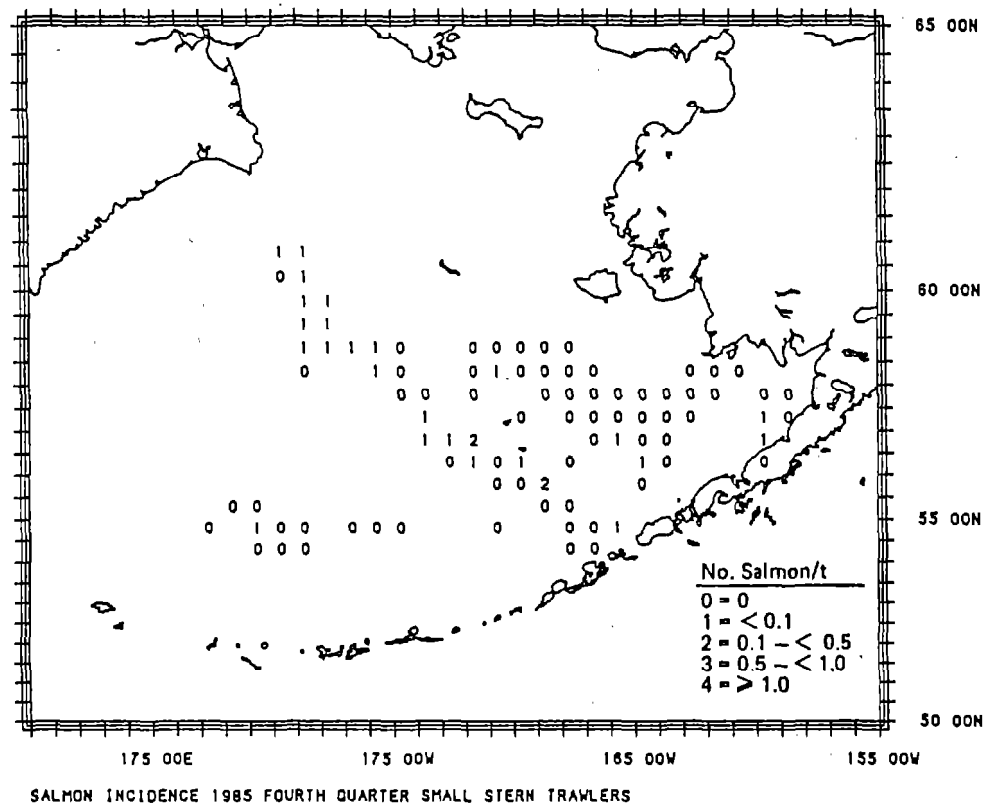
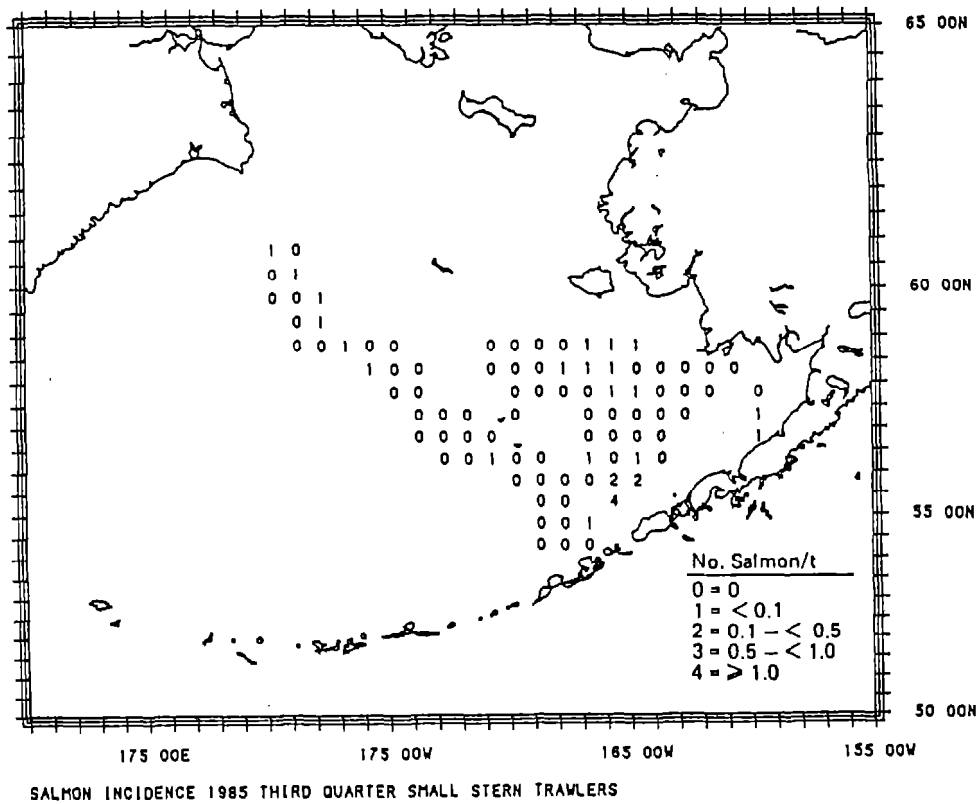


Figure B2. --Continued.

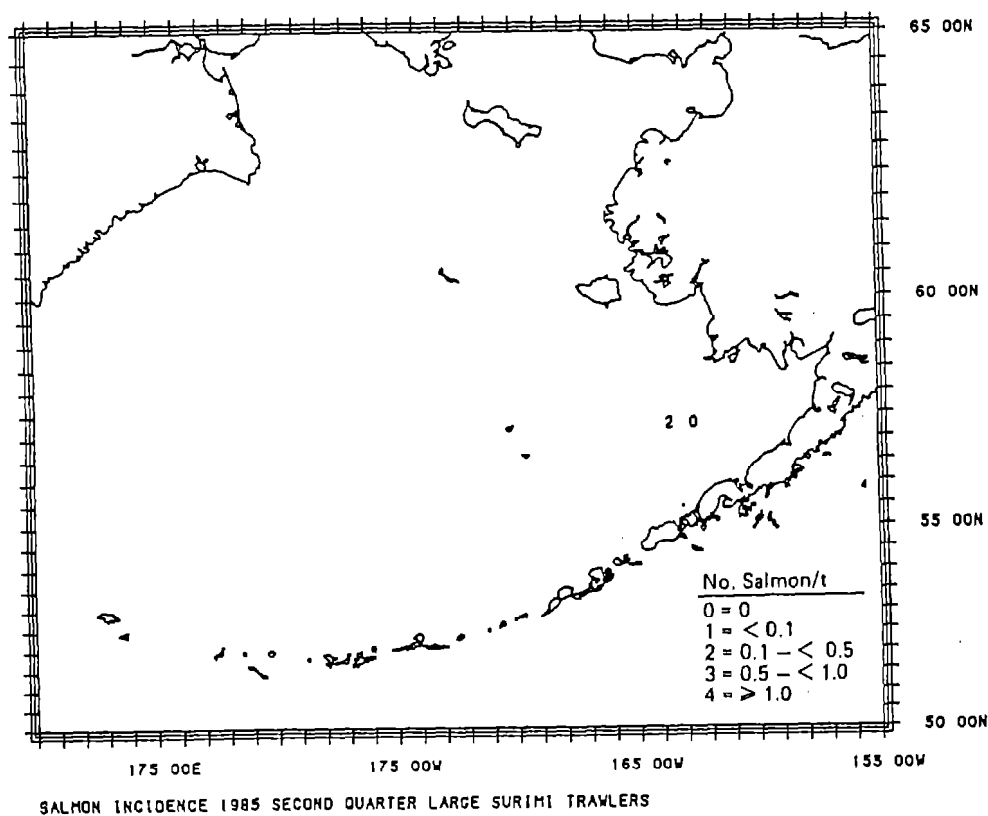
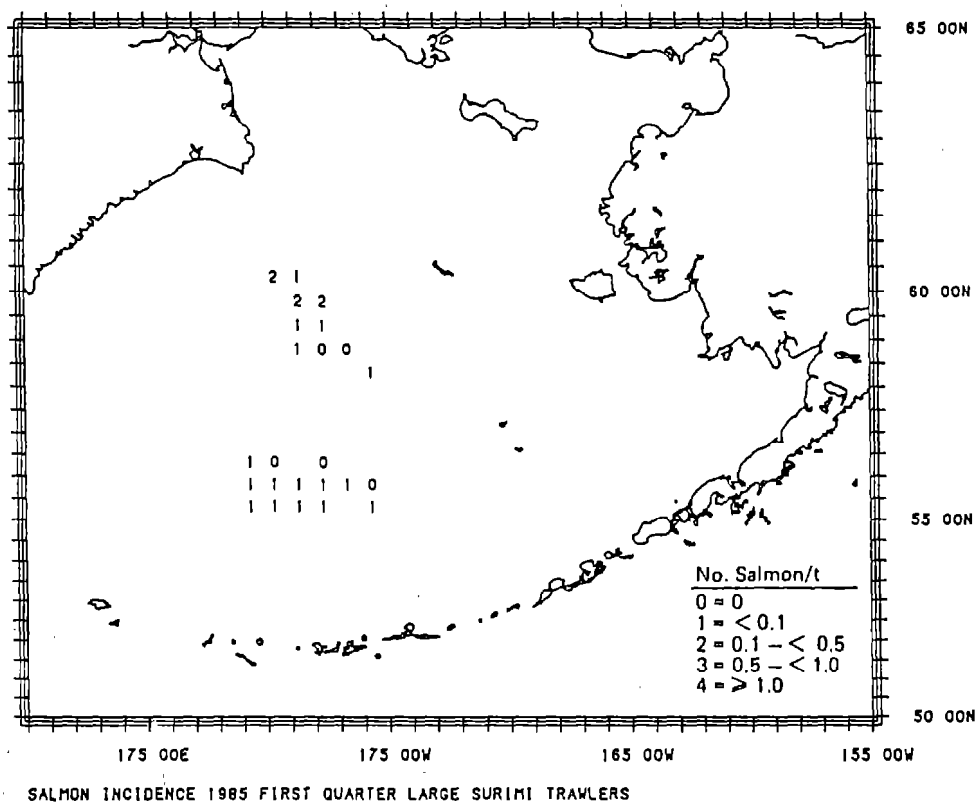


Figure B3. --Average incidence (no./t) of salmon on surimi trawlers (all nations) by quarter and $1/2^\circ$ lat. by 1° long. areas, 1985.

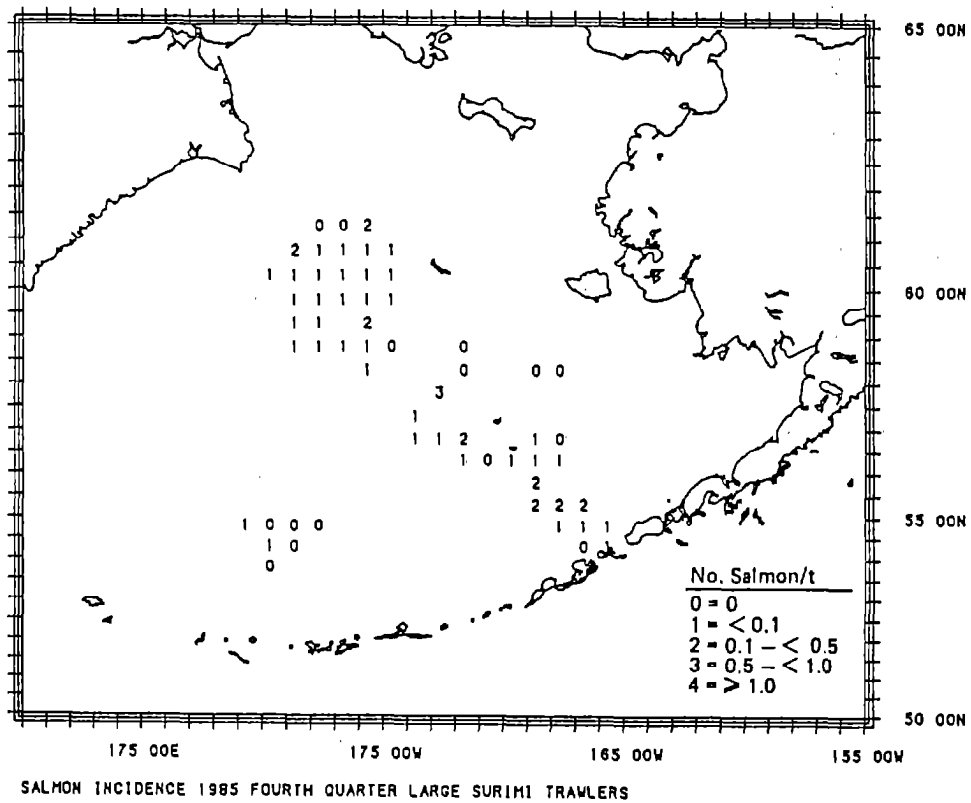
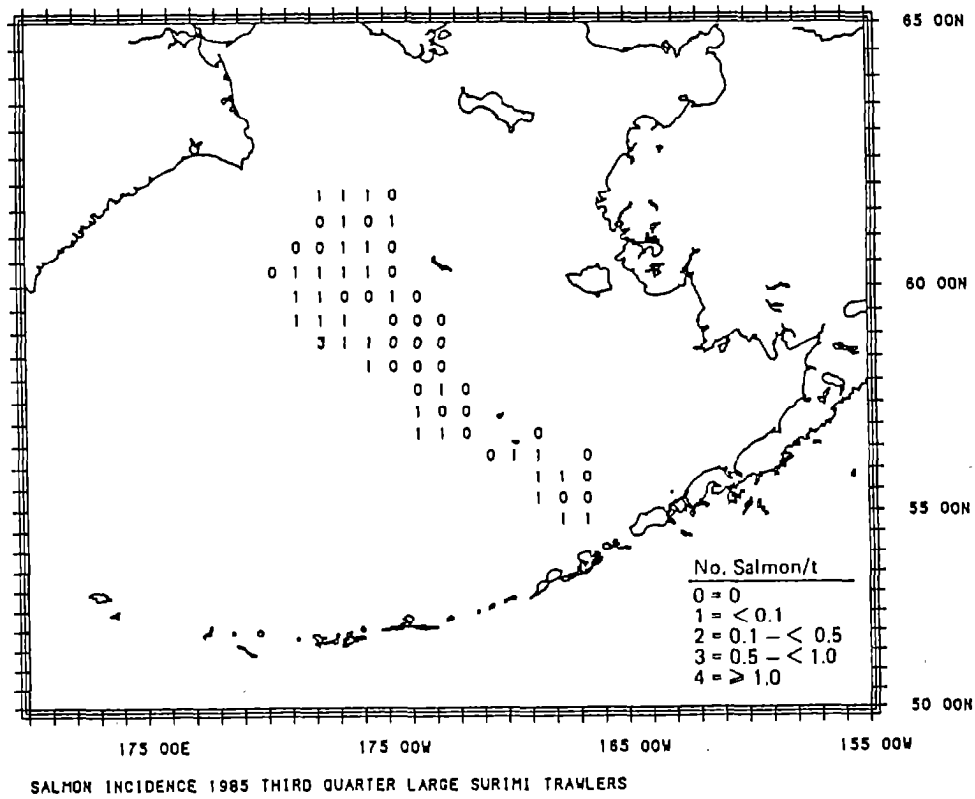


Figure B3.--Continued.

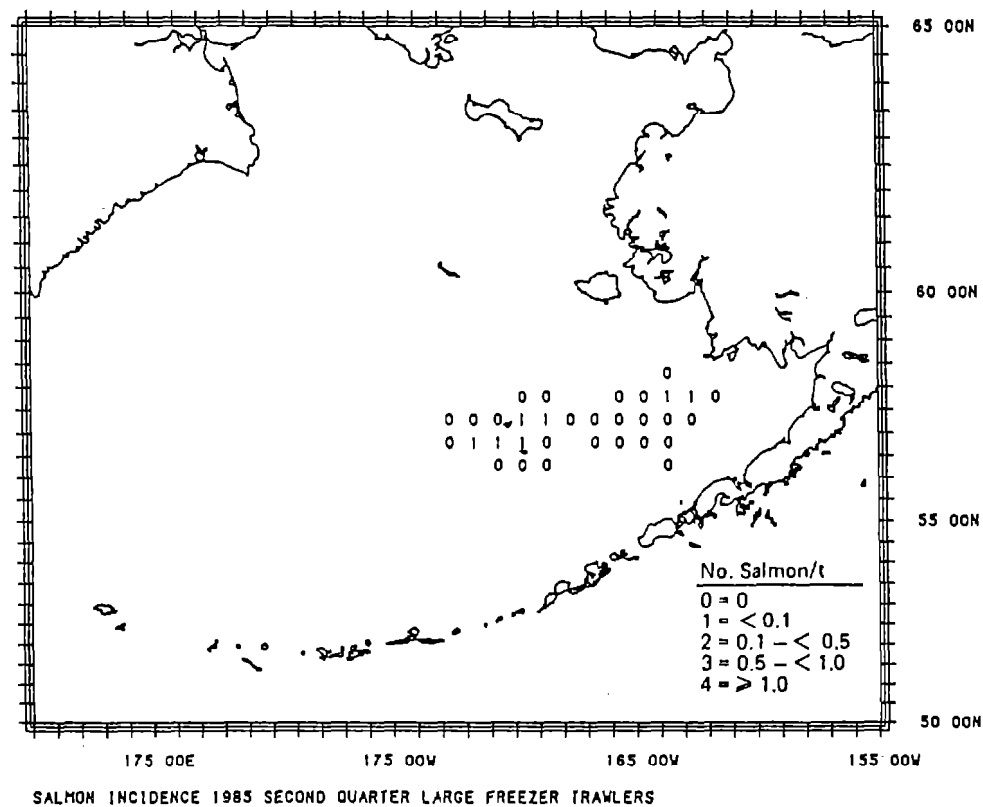
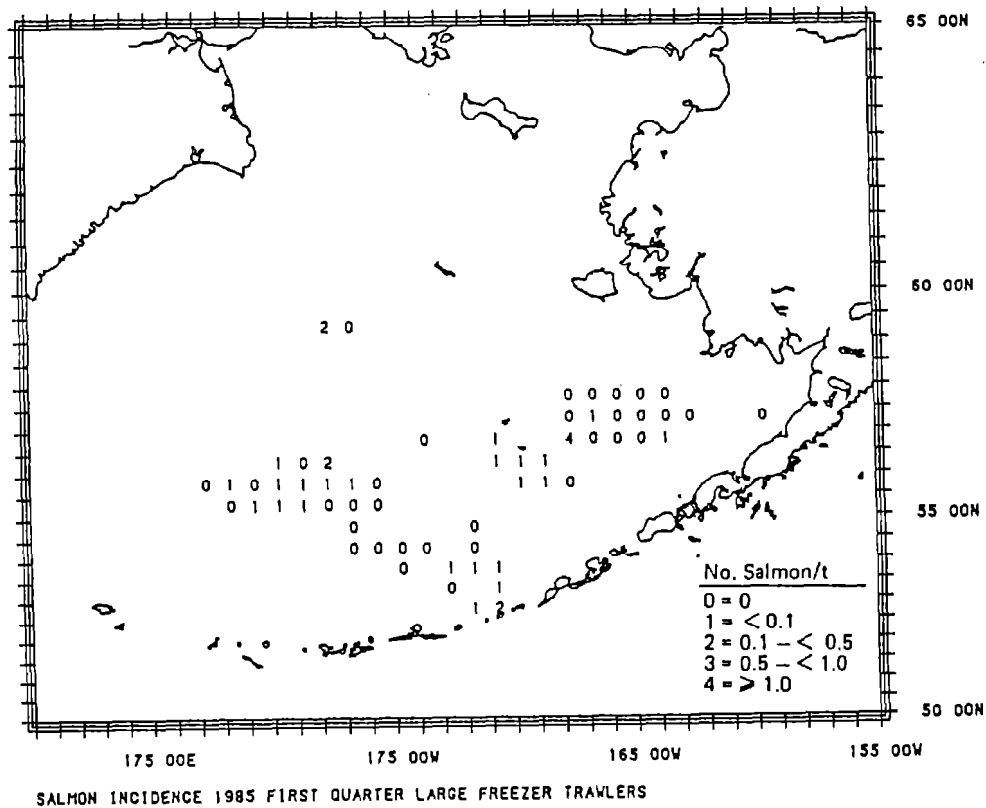


Figure B4. --Average incidence (no./t) of salmon on large freezer trawlers (all nations) by quarter and 1/2° lat. by 1° long. areas, 1985.

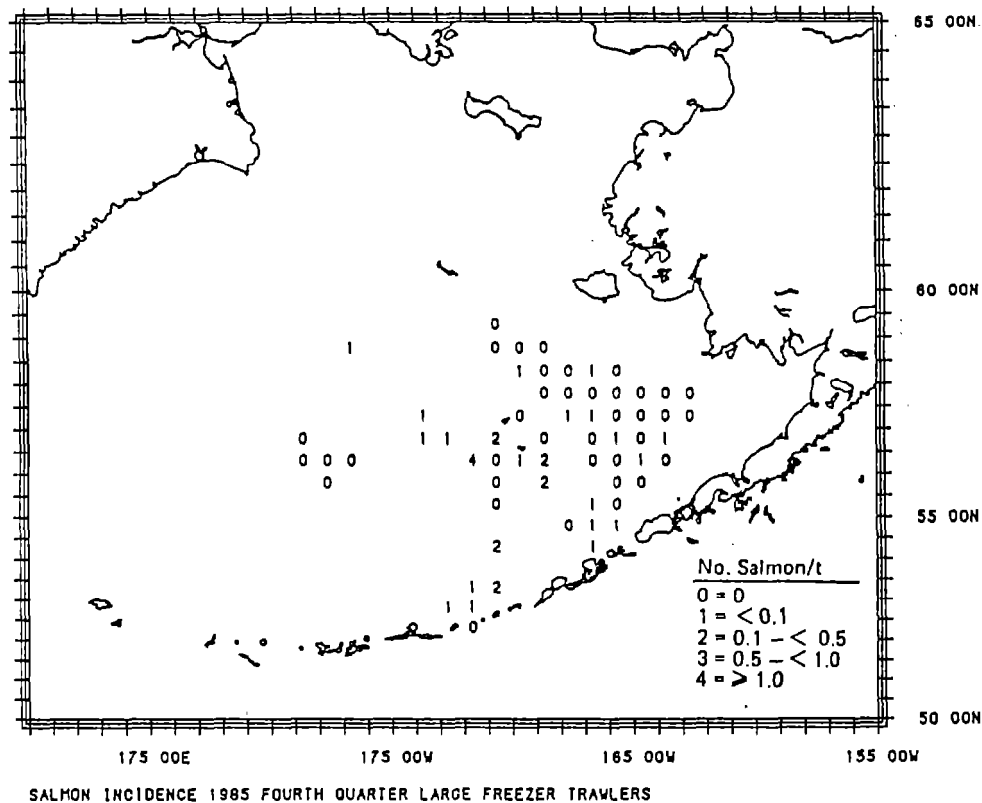
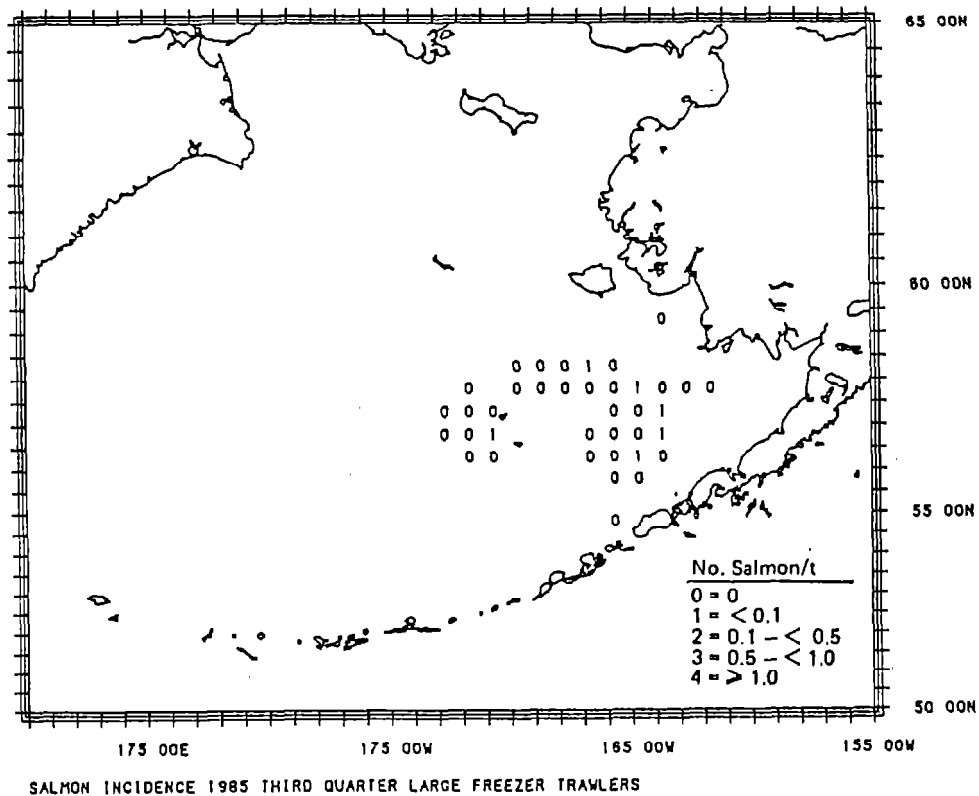


Figure B4. --Continued.

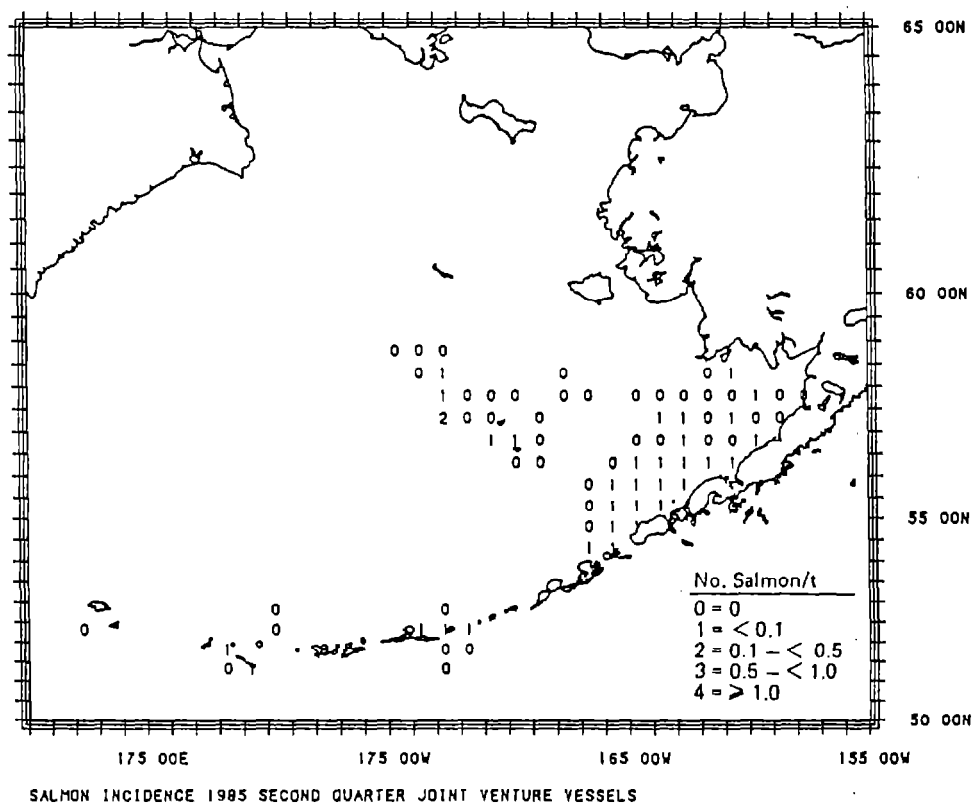
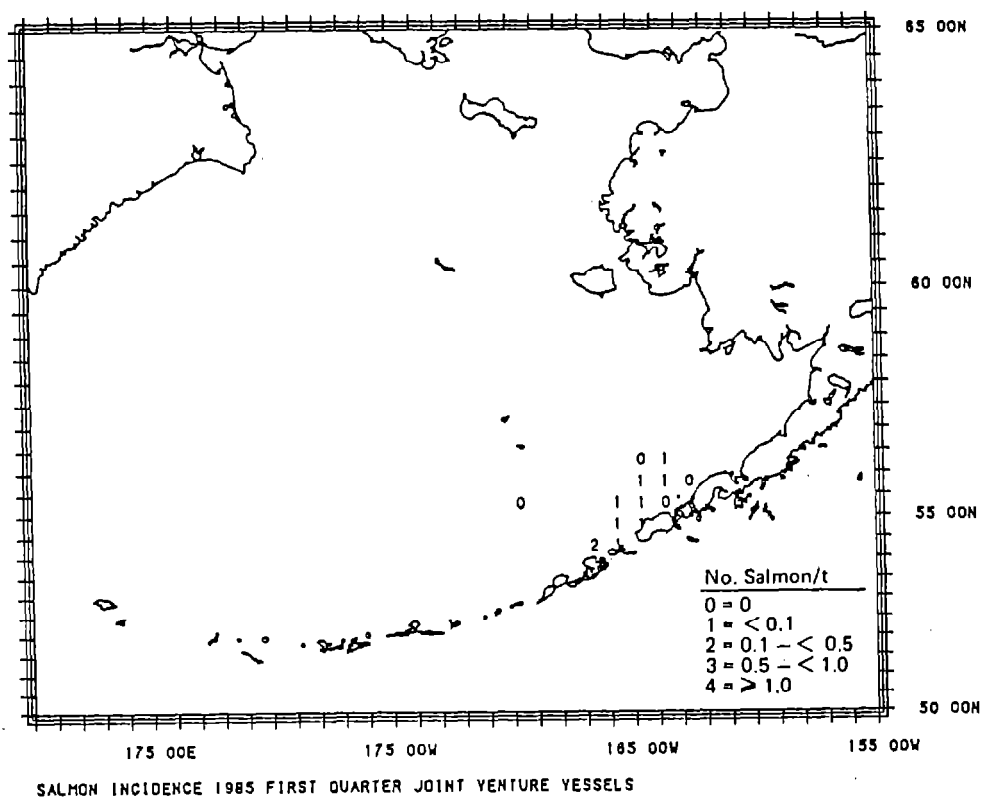
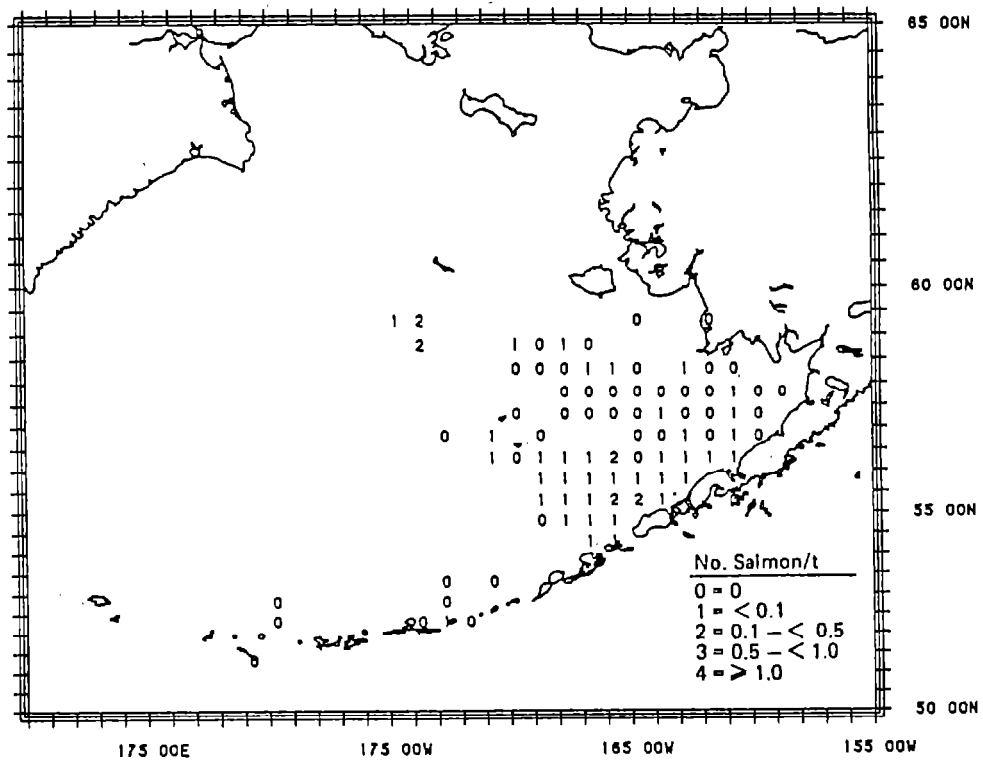
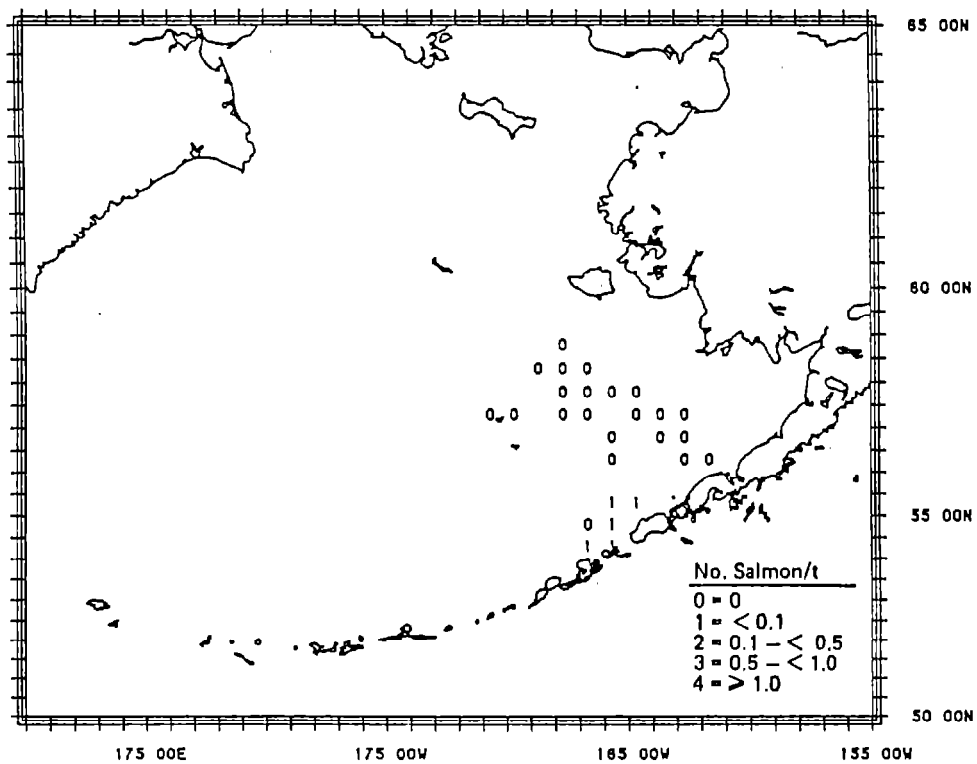


Figure B5. --Average incidence (no./t) of salmon in the joint venture fisheries by quarter and 1/2° lat. by 1° long. areas, 1985.



SALMON INCIDENCE 1985 THIRD QUARTER JOINT VENTURE VESSELS



SALMON INCIDENCE 1985 FOURTH QUARTER JOINT VENTURE VESSELS

Table B5.--Estimated incidental catches of Pacific salmon (in numbers of fish and metric tons) by foreign groundfish and joint venture vessels in the Bering Sea/Aleutian region, 1985.

| | Number of fish | | | | | Weight (metric tons) | | | | |
|--------------------------------------|----------------|------------|-------------|------------|--------------------|----------------------|------------|-------------|------------|--------------------|
| | Area I | Area II | Area III | Area IV | Total all areas | Area I | Area II | Area III | Area IV | Total all areas |
| -----Foreign groundfish vessels----- | | | | | | | | | | |
| Japan | | | | | | | | | | |
| SMS | 0 | 1,116 | - | - | 1,116 | 0.00 | 3.53 | - | - | 3.53 |
| FMS | 0 | - | - | - | 0 | 0.00 | - | - | - | 0.00 |
| SST | 306 | 369 | - | 14 | 689 | 1.16 | 11.19 | - | 0.03 | 12.38 |
| LST | 2,787 | 2,840 | - | 3 | 5,630 | 8.67 | 1.64 | - | 0.01 | 10.32 |
| LFT | 23 | 0 | - | 0 | 23 | 0.11 | 0.00 | - | 0.00 | 0.11 |
| LL | 0 | 6 | - | 0 | 6 | 0.00 | 0.01 | - | 0.00 | 0.01 |
| Republic of Korea (ROK) | | | | | | | | | | |
| SST | 140 | 0 | - | 0 | 140 | 0.50 | 0.00 | - | 0.00 | 0.50 |
| LFT | 925 | 123 | - | 2 | 1,050 | 3.15 | 0.43 | - | <0.01 | 3.58 |
| Poland | | | | | | | | | | |
| LFT | 870 | 61 | - | 394 | 1,325 | 1.26 | 0.21 | - | 1.08 | 2.55 |
| U.S.S.R. | | | | | | | | | | |
| LFT | 24 | - | - | - | 24 | 0.13 | - | - | - | 0.13 |
| All nations total | 5,075 | 4,515 | - | 413 | 10,003 | 14.98 | 17.01 | - | 1.12 | 33.11 |
| Percent by area | 50.73 | 45.14 | - | 4.13 | | 45.24 | 51.37 | - | 3.38 | |
| -----Joint venture vessels----- | | | | | | | | | | |
| U.S.-Japan | 7,805 | 43 | - | - | 7,848 | 20.74 | 0.28 | - | - | 21.02 |
| U.S.-ROK | 880 | 0 | - | 226 | 1,106 | 2.62 | 0.00 | - | 0.52 | 3.14 |
| U.S.-Poland | 373 | - | - | 3 | 376 | 1.10 | - | - | 0.01 | 1.11 |
| U.S.-Portugal | 21 | - | - | - | 21 | 0.09 | - | - | - | 0.09 |
| U.S.-Taiwan | 2 | - | - | - | 2 | 0.01 | - | - | - | 0.01 |
| U.S.-U.S.S.R. | 1,058 | - | - | 9 | 1,067 | 4.38 | - | - | 0.02 | 4.40 |
| Joint venture totals | 10,139 | 43 | - | 238 | 10,420 | 28.94 | 0.28 | - | 0.55 | 29.77 |
| Percent by area | 97.30 | 0.41 | - | 2.28 | | 97.21 | 0.94 | - | 1.85 | |

SMS = Surimi motherships
FMS = Freezer motherships

SST = Small stern trawler
LST = Large surimi trawler

LFT = Large freezer trawler
LL = Longliner

Table B6.--Estimated incidental catches (numbers and metric tons) of salmon (*Oncorhynchus* spp.) in the foreign and joint venture groundfish fisheries in the Bering Sea/Aleutian Islands region, 1977-85^{1/}.

| Year | Foreign | | Joint Venture | | Total | |
|------|---------|-----|---------------|-----|---------|-----|
| | Nos. | t | Nos. | t | Nos. | t |
| 1977 | 47,840 | 198 | NF | NF | 47,840 | 198 |
| 1978 | 44,548 | 137 | NF | NF | 44,548 | 137 |
| 1979 | 107,706 | 340 | NF | NF | 107,706 | 340 |
| 1980 | 120,104 | 381 | 1,898 | 7 | 122,002 | 388 |
| 1981 | 42,337 | 137 | 854 | 3 | 43,191 | 140 |
| 1982 | 21,241 | 85 | 2,382 | 8 | 23,623 | 92 |
| 1983 | 18,173 | 66 | 24,493 | 54 | 42,666 | 120 |
| 1984 | 16,516 | 51 | 67,622 | 160 | 84,138 | 211 |
| 1985 | 10,003 | 33 | 10,420 | 30 | 20,423 | 63 |

^{1/} Estimated catches for years 1977-84 from Berger et al., 1985.

NF = No fishing.

Table B7. --Biological data on the incidental catch of Pacific salmon in the foreign and joint venture groundfish fishery in the Bering Sea/Aleutian Islands region, 1985.

| Species | Percent by species | Sex | Sex composition | Average weight (kg) | Average length (cm) |
|--------------------------------------|-----------------------|----------|--------------------|------------------------|------------------------|
| -----Foreign directed fisheries----- | | | | | |
| Chinook | 70.70 | Male | 37.39 | 3.09 | 59.1 |
| | | Female | 44.46 | 3.58 | 61.6 |
| | | Unsexed | 18.16 | 2.91 | 54.8 |
| | | Combined | | 3.27 | 59.4 |
| Chum | 28.98 | Male | 45.68 | 3.55 | 63.9 |
| | | Female | 43.63 | 3.31 | 62.8 |
| | | Unsexed | 10.69 | 3.98 | 66.3 |
| | | Combined | | 3.49 | 63.7 |
| Coho | 0.20 | Male | 23.92 | 3.78 | 63.0 |
| | | Female | 12.27 | 3.15 | 64.0 |
| | | Unsexed | 63.80 | 1.66 | 52.5 |
| | | Combined | | 2.35 | 56.5 |
| Sockeye | 0.12 | Male | 83.92 | 2.99 | 55.8 |
| | | Female | 16.08 | 2.80 | 62.0 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 2.96 | 56.8 |
| -----Joint venture fisheries----- | | | | | |
| Chinook | 24.22 | Male | 42.66 | 3.49 | 61.7 |
| | | Female | 52.16 | 3.75 | 65.2 |
| | | Unsexed | 5.19 | 5.01 | 61.7 |
| | | Combined | | 3.70 | 63.6 |
| Chum | 73.89 | Male | 55.30 | 3.10 | 60.0 |
| | | Female | 40.40 | 2.95 | 59.2 |
| | | Unsexed | 4.30 | 3.14 | 64.3 |
| | | Combined | | 3.04 | 59.9 |
| Coho | 1.06 | Male | 40.73 | 3.16 | 56.5 |
| | | Female | 55.39 | 3.63 | 64.4 |
| | | Unsexed | 3.87 | 2.54 | 54.2 |
| | | Combined | | 3.40 | 60.8 |
| Sockeye | 0.61 | Male | 77.72 | 2.91 | 62.4 |
| | | Female | 22.28 | 2.44 | 59.6 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 2.80 | 61.7 |
| Pink | 0.22 | Male | 24.35 | 1.94 | 36.9 |
| | | Female | 67.30 | 1.97 | 52.6 |
| | | Unsexed | 8.35 | 2.00 | 49.0 |
| | | Combined | | 1.96 | 48.5 |

Table B8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. Lines indicate areas not fished.

| AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---------------------------------------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Surimi Mothership----- | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | 0.020 | 2.806 | -- | -- | -- |
| JULY | NS | NS | 0.003 | 9.420 | -- | -- | -- |
| AUG. | -- | -- | 0.002 | 2.081 | -- | -- | -- |
| SEPT. | -- | -- | 0.003 | 5.222 | -- | -- | -- |
| OCT. | -- | -- | 0.006 | 9.433 | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | NS | NS | 0.004 | 5.827 | -- | -- | -- |
| -----Japanese Freezer Mothership----- | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- |
| JULY | 0.958 | 2.819 | -- | -- | -- | -- | -- |
| AUG. | 1.333 | 2.132 | -- | -- | -- | -- | -- |
| SEPT. | 0.775 | 3.060 | -- | -- | -- | -- | -- |
| OCT. | 0.551 | 3.070 | -- | -- | -- | -- | -- |
| NOV. | 1.498 | 2.880 | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.946 | 2.659 | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Small Trawler----- | | | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| FEB. | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | 1.046 | 5.609 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| APRIL | 0.687 | 6.074 | 2.015 | 6.158 | -- | -- | 0.000 | 0.000 |
| MAY | 0.853 | 5.576 | 1.448 | 6.753 | -- | -- | -- | -- |
| JUNE | 2.189 | 5.273 | 0.564 | 5.772 | -- | -- | -- | -- |
| JULY | 1.885 | 5.570 | 1.201 | 5.630 | -- | -- | -- | -- |
| AUG. | 1.538 | 5.660 | 0.278 | 6.168 | -- | -- | -- | -- |
| SEPT. | 2.696 | 5.116 | 0.549 | 6.443 | -- | -- | -- | -- |
| OCT. | 0.784 | 5.616 | 1.125 | 5.215 | -- | -- | -- | -- |
| NOV. | 2.724 | 8.209 | 1.216 | 7.413 | -- | -- | -- | -- |
| DEC. | 1.328 | 11.925 | 1.412 | 6.230 | 0.000 | 0.000 | -- | -- |
| ANNUAL | 1.831 | 6.077 | 0.839 | 6.395 | 0.000 | 0.000 | 0.000 | 0.000 |
| -----Japanese Large Freezer Trawler----- | | | | | | | | |
| JAN. | 1.065 | 4.527 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| FEB. | 0.729 | 3.730 | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | 0.542 | 4.876 | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| APRIL | 0.504 | 5.189 | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | 1.221 | 2.567 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.465 | 3.468 | -- | -- | -- | -- | -- | -- |
| NOV. | 1.663 | 4.070 | 0.315 | 5.922 | -- | -- | -- | -- |
| DEC. | 1.101 | 4.024 | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.857 | 4.062 | 0.275 | 5.922 | 0.000 | 0.000 | 0.000 | 0.000 |

*Exclusive Economic Zone

Table B8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Surimi Large Trawler----- | | | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| FEB. | -- | -- | 0.000 | 6.400 | -- | -- | 0.000 | 0.000 |
| MARCH | -- | -- | 0.013 | 1.805 | -- | -- | -- | -- |
| APR | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | 2.586 | 4.377 | -- | -- | -- | -- | -- | -- |
| JULY | 0.013 | 19.181 | 0.033 | 5.206 | -- | -- | -- | -- |
| AUG. | 0.004 | 32.780 | 0.010 | 3.993 | -- | -- | -- | -- |
| SEPT. | 0.022 | 6.084 | 0.044 | 5.414 | -- | -- | -- | -- |
| OCT. | 0.038 | 5.192 | 0.046 | 5.939 | -- | -- | -- | -- |
| NOV. | 0.036 | 5.738 | 0.039 | 6.933 | -- | -- | -- | -- |
| DEC. | 0.411 | 3.117 | 0.016 | 10.962 | 0.000 | 0.000 | -- | -- |
| ANNUAL | 0.040 | 5.303 | 0.025 | 6.856 | 0.000 | 0.000 | 0.000 | 0.000 |
| -----Japanese Longliners Fishing <500 M----- | | | | | | | | |
| JAN. | NS | NS | 7.400 | 3.097 | -- | -- | -- | -- |
| FEB. | 10.157 | 2.455 | 7.702 | 3.322 | -- | -- | -- | -- |
| MARCH | 5.430 | 2.078 | 6.371 | 2.176 | -- | -- | -- | -- |
| APRIL | 9.569 | 2.042 | 5.028 | 2.793 | -- | -- | -- | -- |
| MAY | NS | NS | NS | NS | NS | NS | -- | -- |
| JUNE | -- | -- | 1.074 | 2.435 | -- | -- | -- | -- |
| JULY | -- | -- | NS | NS | -- | -- | -- | -- |
| AUG. | -- | -- | 4.564 | 2.704 | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | 0.895 | 2.550 | 2.023 | 2.710 | NS | NS | -- | -- |
| NOV. | 6.749 | 2.734 | 4.494 | 2.968 | 36.530 | 0.942 | -- | -- |
| DEC. | 12.904 | 2.955 | 7.591 | 3.770 | 18.630 | 3.003 | -- | -- |
| ANNUAL | 10.125 | 2.677 | 5.521 | 3.175 | 20.664 | 2.589 | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Longliners Fishing >500 M----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | 0.698 | 3.636 | -- | -- |
| ANNUAL | -- | -- | -- | -- | 0.698 | 3.636 | -- | -- |
| -----U.S.S.R. Large Freezer Trawler----- | | | | | | | | |
| JAN. | 0.024 | 4.910 | -- | -- | -- | -- | -- | -- |
| FEB. | 0.147 | 8.201 | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.031 | 5.715 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

Table B8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
 Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Polish Large Freezer Trawler----- | | | | | | | | |
| JAN. | 0.001 | 3.800 | 0.002 | 4.515 | 0.001 | 2.650 | 0.000 | 0.000 |
| FEB. | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| MARCH | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | -- | -- | NS | NS | -- | -- |
| NOV. | 0.002 | 0.933 | -- | -- | 0.000 | 0.000 | -- | -- |
| DEC. | 0.000 | 0.000 | 0.000 | 0.000 | <0.001 | 1.130 | 0.000 | 0.000 |
| ANNUAL | 0.002 | 1.010 | 0.002 | 4.515 | <0.001 | 1.637 | 0.000 | 0.000 |
| -----Republic of Korea Small Trawler----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | NS | NS | 0.000 | 0.000 | -- | -- |
| MARCH | 0.114 | 8.652 | 1.000 | 4.000 | 0.000 | 0.000 | -- | -- |
| APRIL | 0.156 | 11.474 | -- | -- | -- | -- | -- | -- |
| MAY | 1.024 | 4.298 | 0.000 | 0.000 | -- | -- | -- | -- |
| JUNE | 1.009 | 4.357 | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | 0.107 | 8.248 | 0.257 | 2.717 | -- | -- | -- | -- |
| AUG. | 0.007 | 2.678 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.273 | 5.742 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.908 | 2.764 | -- | -- | -- | -- | -- | -- |
| NOV. | 1.019 | 3.820 | -- | -- | -- | -- | -- | -- |
| DEC. | 1.144 | 3.114 | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.543 | 3.844 | 0.210 | 2.732 | 0.000 | 0.000 | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Republic of Korea Large Freezer Trawler----- | | | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| FEB. | NS | NS | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | 0.131 | 5.535 | 0.058 | 11.486 | -- | -- | -- | -- |
| APRIL | 0.004 | 13.000 | 0.070 | 5.710 | -- | -- | -- | -- |
| MAY | 0.131 | 6.189 | 0.149 | 3.032 | -- | -- | -- | -- |
| JUNE | 0.444 | 2.469 | 0.443 | 4.580 | -- | -- | -- | -- |
| JULY | 0.046 | 4.386 | 0.316 | 3.948 | -- | -- | -- | -- |
| AUG. | 0.007 | 5.475 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.095 | 5.415 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.644 | 2.650 | 1.615 | 3.629 | -- | -- | -- | -- |
| NOV. | 0.948 | 2.744 | 0.063 | 7.615 | -- | -- | -- | -- |
| DEC. | 0.921 | 2.979 | 0.081 | 3.372 | -- | -- | -- | -- |
| ANNUAL | 0.408 | 2.875 | 0.285 | 4.183 | 0.000 | 0.000 | 0.000 | 0.000 |
| -----U.S.-U.S.S.R. JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | 4.145 | 1.345 | -- | -- | -- | -- | -- | -- |
| MARCH | 5.684 | 1.198 | -- | -- | -- | -- | -- | -- |
| APRIL | 0.653 | 2.016 | -- | -- | 0.004 | 2.555 | -- | -- |
| MAY | 0.697 | 2.547 | -- | -- | 0.073 | 3.336 | -- | -- |
| JUNE | 1.807 | 1.907 | -- | -- | 0.527 | 6.621 | -- | -- |
| JULY | 1.507 | 3.132 | -- | -- | 0.747 | 4.264 | -- | -- |
| AUG. | 2.134 | 2.441 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.289 | 4.487 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.854 | 5.499 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.912 | 3.521 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 1.607 | 2.198 | -- | -- | 0.350 | 5.231 | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Republic of Korea JV Mothership----- | | | | | | | | |
| JAN. | 1.914 | 1.459 | -- | -- | -- | -- | -- | -- |
| FEB. | 0.234 | 2.357 | -- | -- | -- | -- | -- | -- |
| MARCH | 0.318 | 2.683 | -- | -- | 1.765 | 1.766 | -- | -- |
| APRIL | 0.980 | 2.491 | -- | -- | 0.449 | 1.632 | -- | -- |
| MAY | 2.038 | 1.835 | NS | NS | 0.718 | 2.282 | -- | -- |
| JUNE | 1.105 | 2.024 | -- | -- | 0.422 | 3.411 | -- | -- |
| JULY | 0.368 | 3.531 | 0.638 | 4.564 | 0.424 | 3.328 | -- | -- |
| AUG. | 0.544 | 3.274 | NS | NS | -- | -- | -- | -- |
| SEPT. | 0.426 | 3.735 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.829 | 2.185 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.577 | 2.859 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.744 | 2.523 | 0.638 | 4.564 | 0.550 | 2.578 | -- | -- |
| -----U.S.-Japan JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | 0.005 | 3.612 | -- | -- | -- | -- | -- | -- |
| APRIL | 0.018 | 1.905 | -- | -- | -- | -- | -- | -- |
| MAY | 0.879 | 1.399 | -- | -- | -- | -- | -- | -- |
| JUNE | 2.167 | 1.491 | 0.060 | 2.455 | -- | -- | -- | -- |
| JULY | 0.300 | 1.833 | 0.014 | 5.466 | -- | -- | -- | -- |
| AUG. | 0.472 | 1.894 | 0.003 | 1.110 | -- | -- | -- | -- |
| SEPT. | 0.121 | 3.548 | 0.000 | 0.000 | -- | -- | -- | -- |
| OCT. | 2.783 | 3.364 | 50.952 | 1.731 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.357 | 1.958 | 0.137 | 2.014 | -- | -- | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|-------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Poland JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | 0.395 | 1.690 | -- | -- | -- | -- | -- | -- |
| MAY | 0.462 | 1.796 | -- | -- | -- | -- | -- | -- |
| JUNE | 1.370 | 2.755 | -- | -- | -- | -- | -- | -- |
| JULY | 0.010 | 4.301 | -- | -- | 0.000 | 0.000 | -- | -- |
| AUG. | 0.004 | 4.450 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.046 | 3.616 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.038 | 2.800 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.253 | 3.783 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.221 | 2.201 | -- | -- | 0.000 | 0.000 | -- | -- |
| -----U.S.-Taiwan JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | 3.245 | 3.408 | -- | -- | -- | -- | -- | -- |
| JULY | 3.605 | 2.154 | -- | -- | -- | -- | -- | -- |
| AUG. | 6.248 | 2.088 | -- | -- | -- | -- | -- | -- |
| SEPT. | NS | NS | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 4.164 | 2.691 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Portugal JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | 3.684 | 1.406 | -- | -- | -- | -- | -- | -- |
| MARCH | 5.644 | 1.900 | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 4.333 | 1.620 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

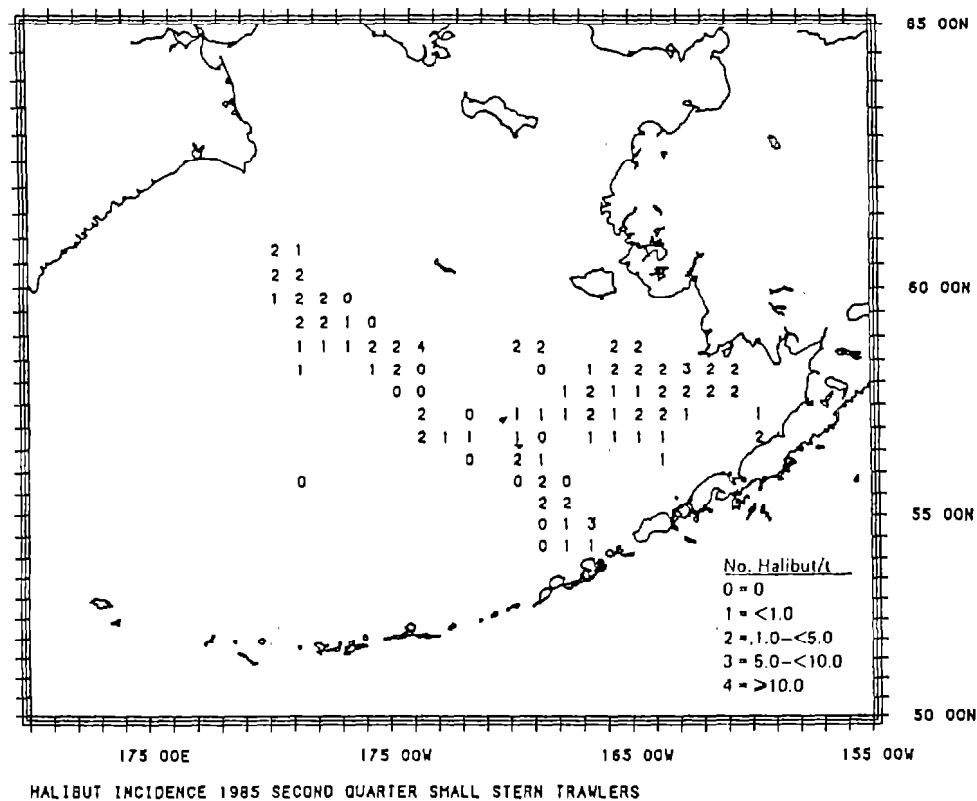
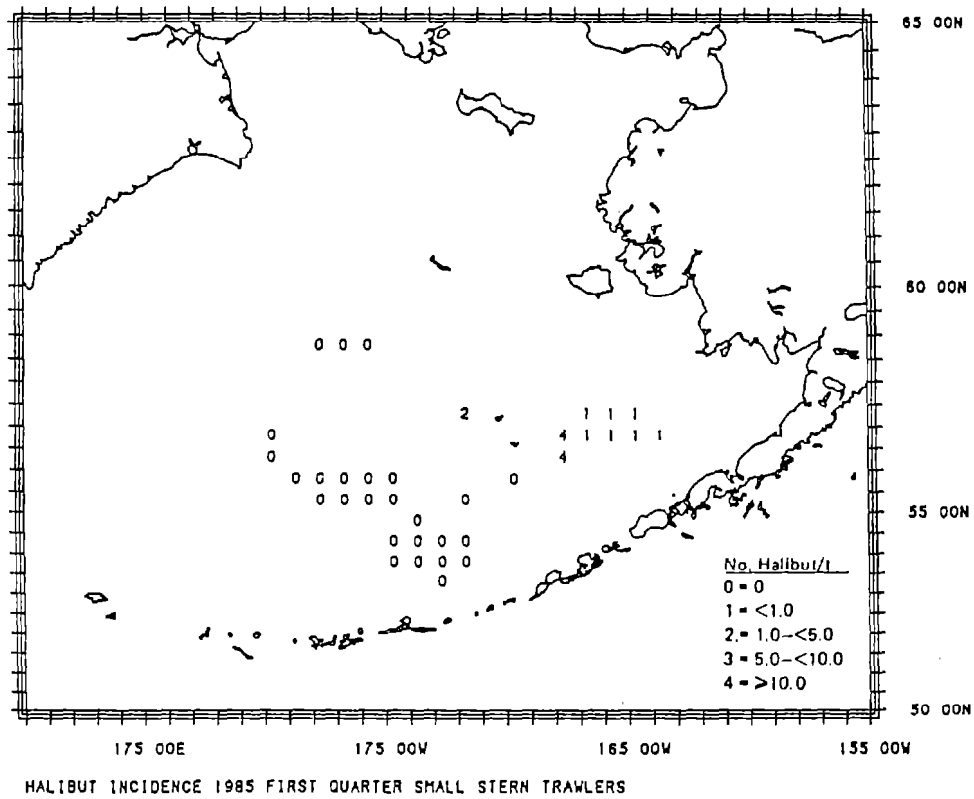


Figure B6.--Average incidence (no./t) of Pacific halibut on small stern trawlers (all nations) by quarter and 1/2° lat. by 1° long. areas, 1985.

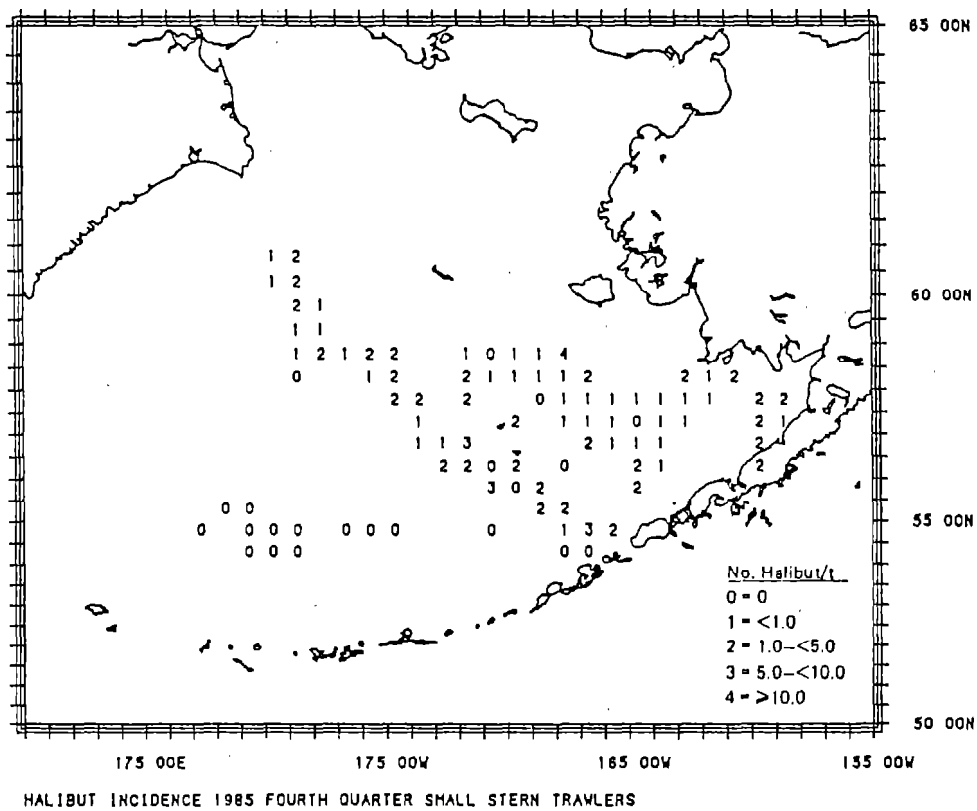
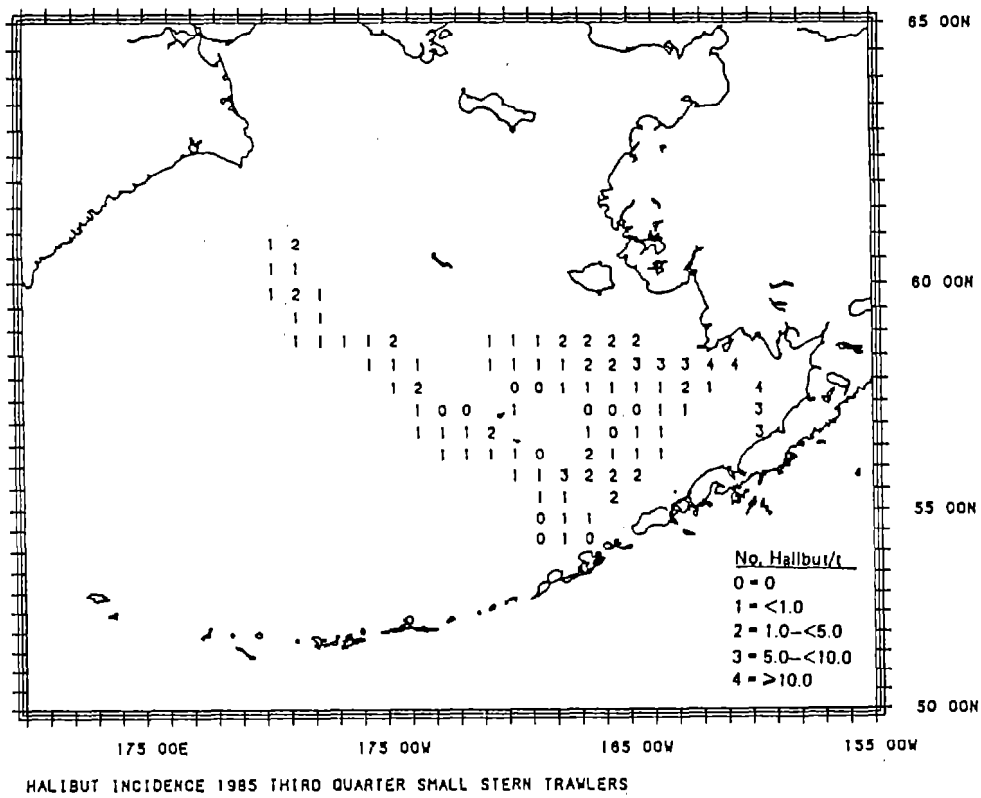
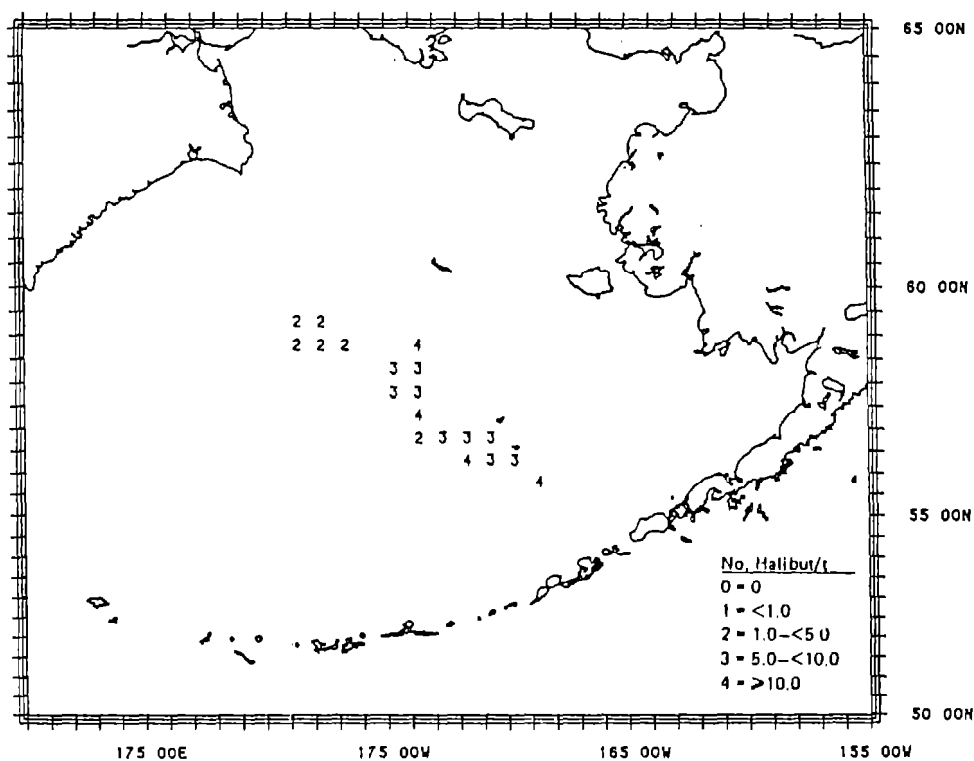
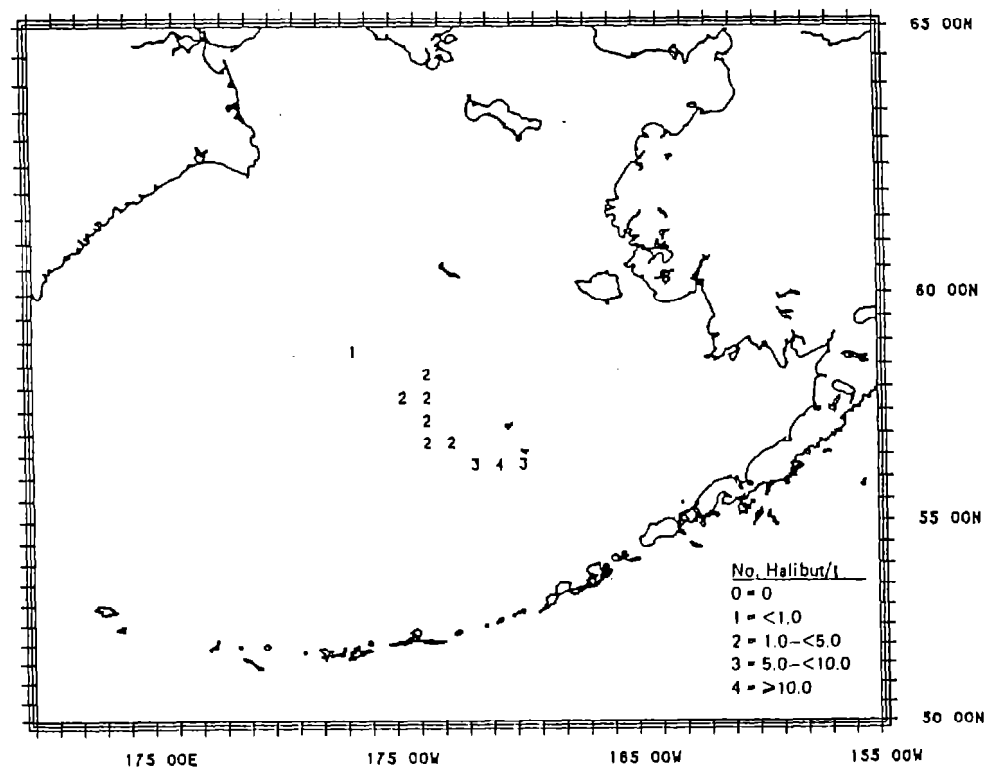


Figure B6. --Continued.



HALIBUT INCIDENCE 1985 FIRST QUARTER LONGLINE VESSELS



HALIBUT INCIDENCE 1985 SECOND QUARTER LONGLINE VESSELS

Figure B7.--Average incidence (no./t) of Pacific halibut on longline vessels (all nations) by quarter and $1/2^{\circ}$ lat. by 1° long. areas, 1985.

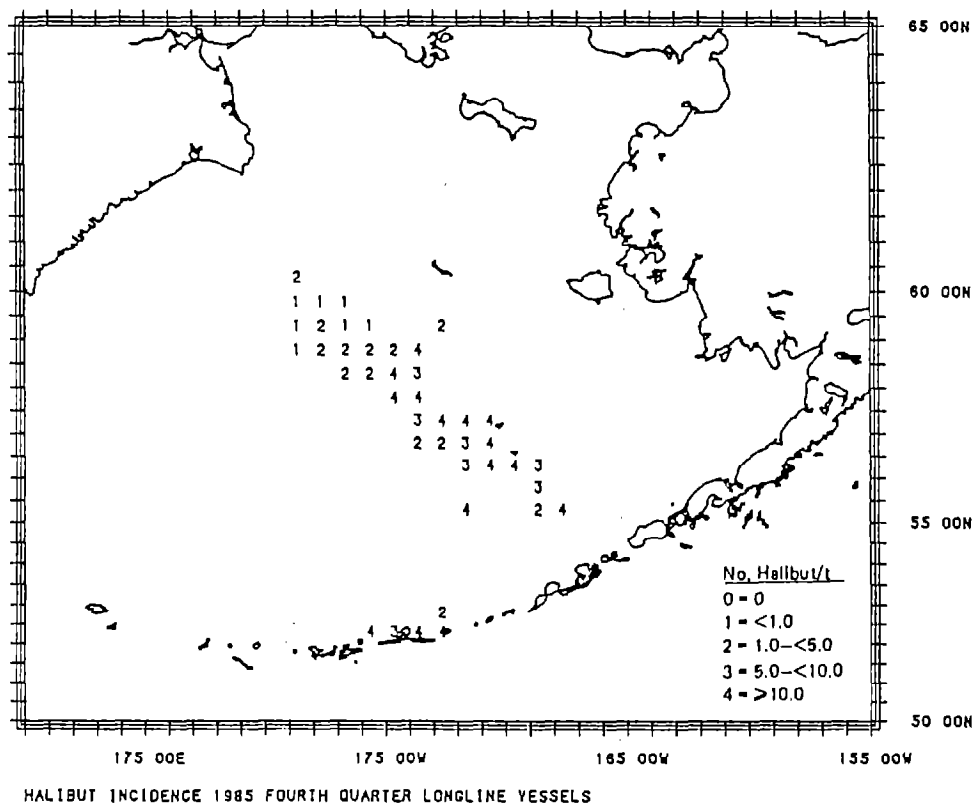
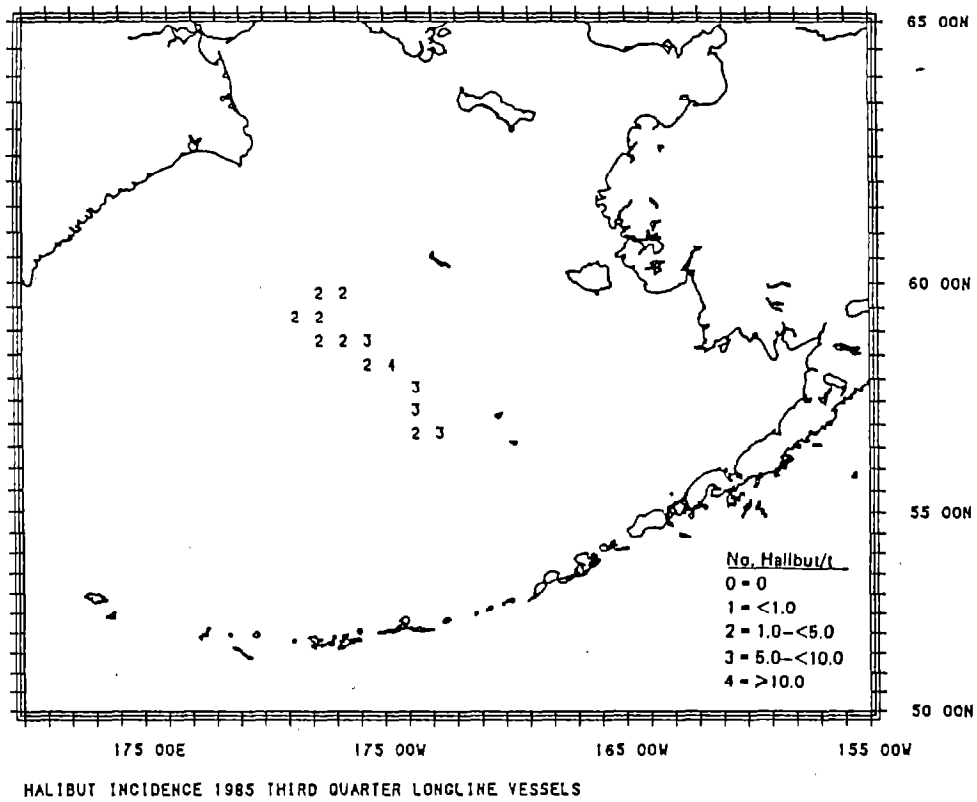


Figure B7 .--Continued.

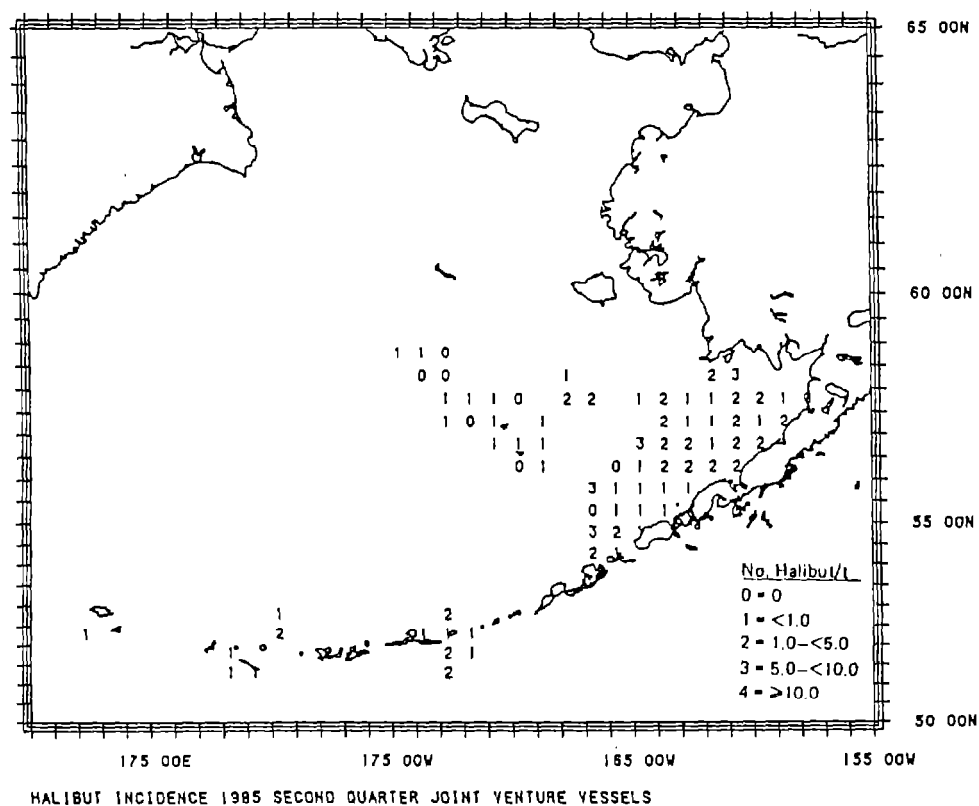
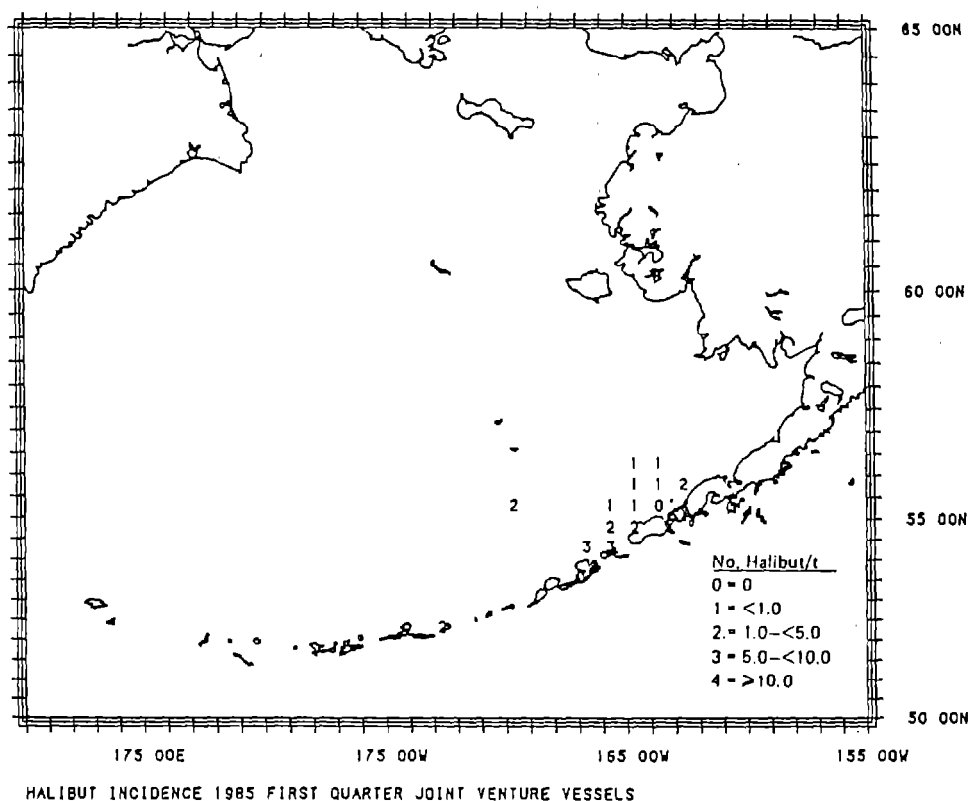


Figure B8. --Average incidence (no./t) of Pacific halibut in the joint venture fisheries by quarter and $1/2^\circ$ lat by 1° long. areas, 1985.

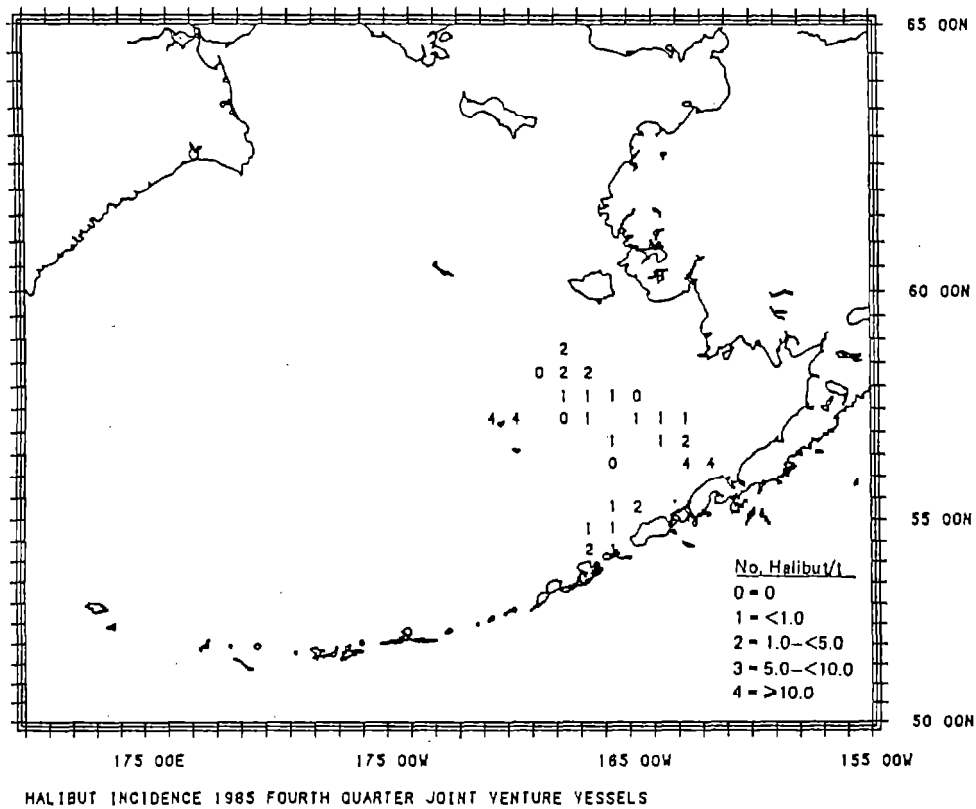
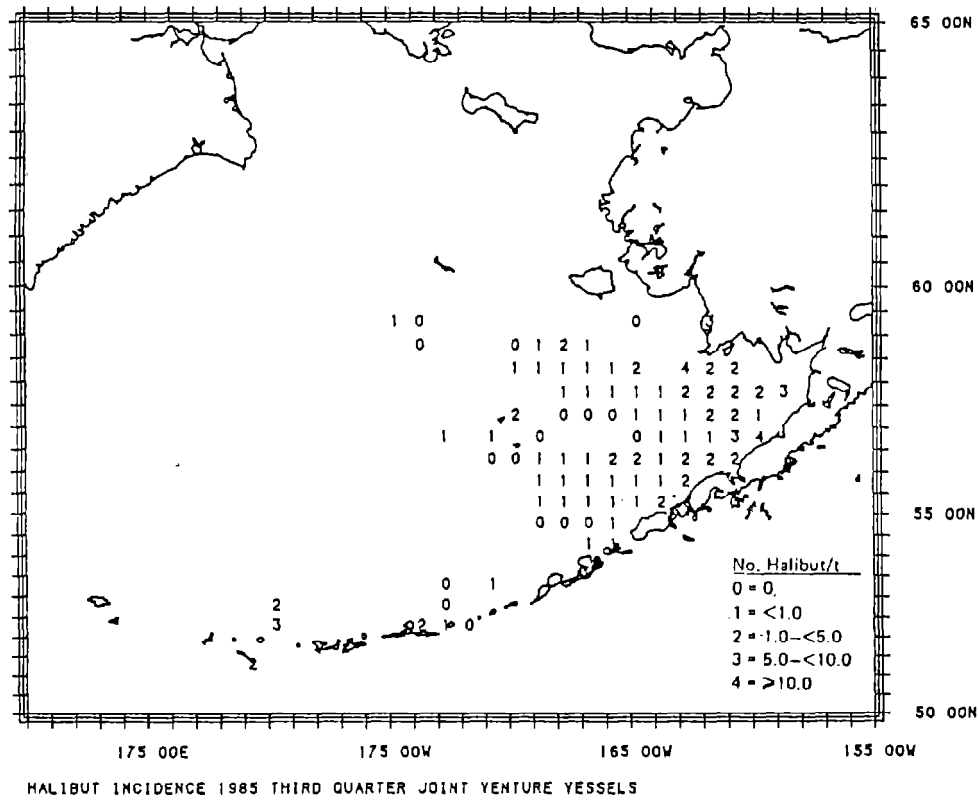


Figure B8. --Continued.

Table B9.--Estimated incidental catches of Pacific halibut (In numbers of fish and metric tons) by foreign groundfish and joint venture vessels in the Bering Sea/Aleutian region, 1985.

[illegible]

Table B10.--Estimated incidental catches (numbers and metric tons) of Pacific halibut (*Hippoglossus stenolepis*) in the foreign and U.S. joint venture groundfish fisheries in the Bering Sea/Aleutian Islands region, 1977-85

| Year | Foreign | | Joint Venture | | Total | |
|------|---------|-------|---------------|-------|-----------|-------|
| | Nos. | t | Nos. | t | Nos. | t |
| 1977 | 344,973 | 1,453 | NF | NF | 344,973 | 1,453 |
| 1978 | 599,852 | 2,853 | NF | NF | 599,852 | 2,853 |
| 1979 | 583,811 | 2,863 | NF | NF | 583,811 | 2,863 |
| 1980 | 959,566 | 4,311 | 204,948 | 286 | 1,164,514 | 4,597 |
| 1981 | 988,731 | 2,704 | 103,616 | 232 | 1,092,347 | 2,936 |
| 1982 | 423,340 | 1,609 | 412,115 | 563 | 835,455 | 2,172 |
| 1983 | 515,587 | 1,872 | 274,080 | 438 | 789,667 | 2,310 |
| 1984 | 518,327 | 2,128 | 254,273 | 617 | 772,600 | 2,745 |
| 1985 | 485,311 | 1,789 | 447,370 | 1,026 | 932,681 | 2,815 |

1/ Estimated catches for years 1977-84 from Berger et al., 1985.

NF = no fishing.

Table B11.--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Surimi Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | 0.106 | 0.072 | -- | -- | -- | -- |
| JULY | NS | NS | 0.020 | 0.088 | -- | -- | -- | -- |
| AUG. | -- | -- | 0.023 | 0.109 | -- | -- | -- | -- |
| SEPT. | -- | -- | 0.043 | 0.146 | -- | -- | -- | -- |
| OCT. | -- | -- | 0.040 | 0.142 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | NS | NS | 0.035 | 0.116 | -- | -- | -- | -- |
| -----Japanese Freezer Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | 0.100 | 0.055 | -- | -- | -- | -- | -- | -- |
| AUG. | 0.266 | 0.117 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.421 | 0.111 | -- | -- | -- | -- | -- | -- |
| OCT. | 2.525 | 0.072 | -- | -- | -- | -- | -- | -- |
| NOV. | 2.490 | 0.059 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.964 | 0.077 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B11.--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
 Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Small Trawler----- | | | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| FEB. | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | 11.216 | 0.132 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| APRIL | 10.770 | 0.162 | 7.271 | 0.115 | -- | -- | 0.000 | 0.000 |
| MAY | 7.705 | 0.189 | 20.689 | 0.103 | -- | -- | -- | -- |
| JUNE | 37.220 | 0.114 | 6.688 | 0.176 | -- | -- | -- | -- |
| JULY | 3.603 | 0.182 | 3.799 | 0.142 | -- | -- | -- | -- |
| AUG. | 3.824 | 0.164 | 4.373 | 0.140 | -- | -- | -- | -- |
| SEPT. | 10.108 | 0.123 | 16.040 | 0.127 | -- | -- | -- | -- |
| OCT. | 14.456 | 0.099 | 10.180 | 0.105 | -- | -- | -- | -- |
| NOV. | 11.095 | 0.186 | 5.934 | 0.230 | -- | -- | -- | -- |
| DEC. | 4.760 | 0.227 | 10.288 | 0.306 | 0.000 | 0.000 | -- | -- |
| ANNUAL | 11.019 | 0.131 | 7.194 | 0.143 | 0.000 | 0.000 | 0.000 | 0.000 |
| -----Japanese Large Freezer Trawler----- | | | | | | | | |
| JAN. | 14.522 | 0.172 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| FEB. | 4.434 | 0.141 | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | 4.385 | 0.174 | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| APRIL | 7.352 | 0.221 | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | 20.975 | 0.059 | -- | -- | -- | -- | -- | -- |
| OCT. | 17.650 | 0.087 | -- | -- | -- | -- | -- | -- |
| NOV. | 9.965 | 0.046 | 115.383 | 0.085 | -- | -- | -- | -- |
| DEC. | 6.686 | 0.066 | -- | -- | -- | -- | -- | -- |
| ANNUAL | 8.495 | 0.107 | 100.692 | 0.085 | 0.000 | 0.000 | 0.000 | 0.000 |

*Exclusive Economic Zone

Table B11 .--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Surimi Large Trawler----- | | | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| FEB. | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| MARCH | -- | -- | 0.080 | 0.103 | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | 14.828 | 0.035 | -- | -- | -- | -- | -- | -- |
| JULY | 0.012 | 0.247 | 0.264 | 0.041 | -- | -- | -- | -- |
| AUG. | 0.027 | 0.440 | 1.093 | 0.117 | -- | -- | -- | -- |
| SEPT. | 0.111 | 0.278 | 0.746 | 0.073 | -- | -- | -- | -- |
| OCT. | 0.163 | 0.228 | 0.638 | 0.100 | -- | -- | -- | -- |
| NOV. | 0.012 | 0.210 | 0.120 | 0.080 | -- | -- | -- | -- |
| DEC. | 0.280 | 0.110 | 0.566 | 0.106 | 0.000 | 0.000 | -- | -- |
| ANNUAL | 0.102 | 0.220 | 0.531 | 0.097 | 0.000 | 0.000 | 0.000 | 0.000 |
| -----Japanese Longliners Fishing <500 M----- | | | | | | | | |
| JAN. | NS | NS | 0.156 | 0.445 | -- | -- | -- | -- |
| FEB. | 0.706 | 0.513 | 1.443 | 0.554 | -- | -- | -- | -- |
| MARCH | 0.000 | 0.000 | 0.160 | 0.596 | -- | -- | -- | -- |
| APRIL | 0.404 | 0.450 | 0.008 | 0.200 | -- | -- | -- | -- |
| MAY | NS | NS | NS | NS | NS | NS | -- | -- |
| JUNE | -- | -- | 0.045 | 0.020 | -- | -- | -- | -- |
| JULY | -- | -- | NS | NS | -- | -- | -- | -- |
| AUG. | -- | -- | 0.660 | 0.491 | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | 2.361 | 0.545 | NS | NS | -- | -- |
| NOV. | 0.092 | 0.561 | 3.715 | 0.523 | 0.553 | 0.358 | -- | -- |
| DEC. | 0.751 | 0.601 | 6.146 | 0.586 | 0.020 | 0.267 | -- | -- |
| ANNUAL | 0.561 | 0.554 | 3.176 | 0.568 | 0.080 | 0.338 | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B11.--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Longliners Fishing >500 M----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | 0.000 | 0.000 | -- | -- |
| ANNUAL | -- | -- | -- | -- | 0.000 | 0.000 | -- | -- |
| -----U.S.S.R. Large Freezer Trawler----- | | | | | | | | |
| JAN. | 1.358 | 0.226 | -- | -- | -- | -- | -- | -- |
| FEB. | 0.648 | 0.262 | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 1.322 | 0.226 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

Table B11 --Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Polish Large Freezer Trawler----- | | | | | | | | |
| JAN. | 0.000 | 0.000 | 0.004 | 0.538 | 0.000 | 0.000 | 0.000 | 0.000 |
| FEB. | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| MARCH | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | -- | -- | NS | NS | -- | -- |
| NOV. | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 | -- | -- |
| DEC. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| ANNUAL | 0.000 | 0.000 | 0.003 | 0.538 | 0.000 | 0.000 | 0.000 | 0.000 |
| -----Republic of Korea Small Trawler----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | NS | NS | 0.000 | 0.000 | -- | -- |
| MARCH | 0.386 | 0.353 | 3.000 | 0.333 | 0.000 | 0.000 | -- | -- |
| APRIL | 0.749 | 0.312 | -- | -- | -- | -- | -- | -- |
| MAY | 1.952 | 0.315 | 0.000 | 0.000 | -- | -- | -- | -- |
| JUNE | 3.496 | 0.305 | 1.438 | 0.415 | -- | -- | -- | -- |
| JULY | 0.316 | 0.258 | 0.242 | 0.329 | -- | -- | -- | -- |
| AUG. | 0.654 | 0.260 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.588 | 0.224 | -- | -- | -- | -- | -- | -- |
| OCT. | 2.315 | 0.239 | -- | -- | -- | -- | -- | -- |
| NOV. | 1.099 | 0.304 | -- | -- | -- | -- | -- | -- |
| DEC. | 0.741 | 0.263 | -- | -- | -- | -- | -- | -- |
| ANNUAL | 1.305 | 0.268 | 0.436 | 0.375 | 0.000 | 0.000 | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B11.--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Republic of Korea Large Freezer Trawler----- | | | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| FEB. | NS | NS | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | 0.941 | 0.253 | 0.000 | 0.000 | -- | -- | -- | -- |
| APRIL | 3.087 | 0.206 | 0.423 | 0.259 | -- | -- | -- | -- |
| MAY | 5.374 | 0.092 | 0.616 | 0.250 | -- | -- | -- | -- |
| JUNE | 4.350 | 0.120 | 6.052 | 0.149 | -- | -- | -- | -- |
| JULY | 2.025 | 0.154 | 2.113 | 0.143 | -- | -- | -- | -- |
| AUG. | 1.645 | 0.159 | -- | -- | -- | -- | -- | -- |
| SEPT. | 1.902 | 0.173 | -- | -- | -- | -- | -- | -- |
| OCT. | 2.055 | 0.150 | 3.692 | 0.137 | -- | -- | -- | -- |
| NOV. | 3.326 | 0.115 | 0.000 | 0.000 | -- | -- | -- | -- |
| DEC. | 18.742 | 0.067 | 0.130 | 0.539 | -- | -- | -- | -- |
| ANNUAL | 3.132 | 0.121 | 2.682 | 0.153 | 0.000 | 0.000 | 0.000 | 0.000 |
| -----U.S.-U.S.S.R. JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | 4.251 | 0.149 | -- | -- | -- | -- | -- | -- |
| MARCH | 4.384 | 0.137 | -- | -- | -- | -- | -- | -- |
| APRIL | 2.341 | 0.170 | -- | -- | 0.000 | 0.000 | -- | -- |
| MAY | 1.546 | 0.227 | -- | -- | 0.000 | 0.000 | -- | -- |
| JUNE | 3.475 | 0.248 | -- | -- | 0.000 | 0.000 | -- | -- |
| JULY | 2.415 | 0.126 | -- | -- | 0.000 | 0.000 | -- | -- |
| AUG. | 3.172 | 0.093 | -- | -- | -- | -- | -- | -- |
| SEPT. | 4.427 | 0.086 | -- | -- | -- | -- | -- | -- |
| OCT. | 5.304 | 0.073 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.584 | 0.520 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 3.071 | 0.137 | -- | -- | 0.000 | 0.000 | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B11.--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Republic of Korea JV Mothership----- | | | | | | | | |
| JAN. | 37.183 | 0.303 | -- | -- | -- | -- | -- | -- |
| FEB. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| MARCH | 0.762 | 0.459 | -- | -- | 0.000 | 0.000 | -- | -- |
| APRIL | 0.873 | 0.337 | -- | -- | 0.000 | 0.000 | -- | -- |
| MAY | 3.517 | 0.319 | NS | NS | 0.000 | 0.000 | -- | -- |
| JUNE | 2.621 | 0.251 | -- | -- | 0.000 | 0.000 | -- | -- |
| JULY | 3.570 | 0.145 | 0.058 | 0.250 | 0.000 | 0.000 | -- | -- |
| AUG. | 3.641 | 0.196 | NS | NS | -- | -- | -- | -- |
| SEPT. | 2.118 | 0.227 | -- | -- | -- | -- | -- | -- |
| OCT. | 1.949 | 0.407 | -- | -- | -- | -- | -- | -- |
| NOV. | 2.415 | 0.288 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 2.727 | 0.241 | 0.058 | 0.250 | 0.000 | 0.000 | -- | -- |
| -----U.S.-Japan JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | <0.001 | 0.844 | -- | -- | -- | -- | -- | -- |
| APRIL | 0.013 | 0.093 | -- | -- | -- | -- | -- | -- |
| MAY | 2.222 | 0.196 | -- | -- | -- | -- | -- | -- |
| JUNE | 2.682 | 0.152 | 1.672 | 0.078 | -- | -- | -- | -- |
| JULY | 0.214 | 0.181 | 0.007 | 0.050 | -- | -- | -- | -- |
| AUG. | 0.346 | 0.142 | 0.000 | 0.000 | -- | -- | -- | -- |
| SEPT. | 1.322 | 0.087 | 0.000 | 0.000 | -- | -- | -- | -- |
| OCT. | 16.653 | 0.080 | 4.524 | 0.189 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.647 | 0.117 | 1.337 | 0.078 | -- | -- | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B11.--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|-------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Poland JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | 0.016 | 0.033 | -- | -- | -- | -- | -- | -- |
| MAY | 0.023 | 0.287 | -- | -- | -- | -- | -- | -- |
| JUNE | 0.010 | 0.200 | -- | -- | -- | -- | -- | -- |
| JULY | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 | -- | -- |
| AUG. | 0.006 | 0.367 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.008 | 0.263 | -- | -- | 0.000 | 0.000 | -- | -- |
| -----U.S.-Taiwan JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | 10.574 | 0.091 | -- | -- | -- | -- | -- | -- |
| JULY | 0.764 | 0.354 | -- | -- | -- | -- | -- | -- |
| AUG. | 0.186 | 0.504 | -- | -- | -- | -- | -- | -- |
| SEPT. | NS | NS | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 6.276 | 0.098 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B11.--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
 Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Portugal JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | 1.208 | 0.310 | -- | -- | -- | -- | -- | -- |
| MARCH | 1.985 | 0.362 | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 1.465 | 0.334 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

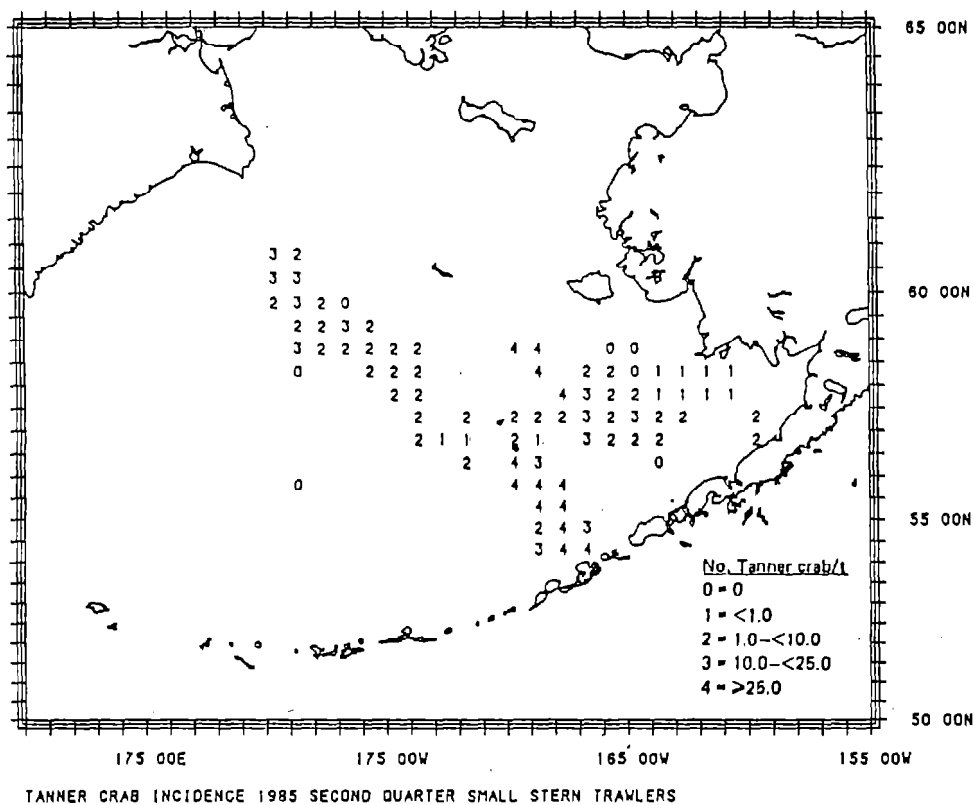
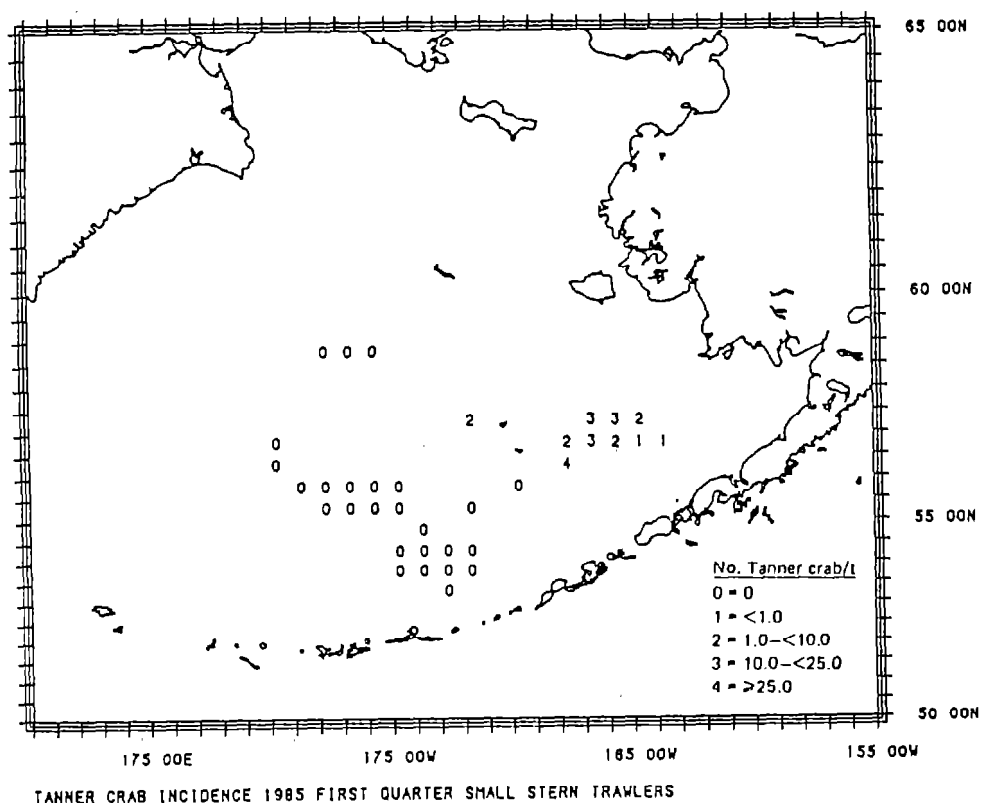


Figure B9.--Average incidence (no./t) of Tanner crab on small stern trawlers (all nations) by quarter and $1/2^\circ$ lat. by 1° long. areas, 1985.

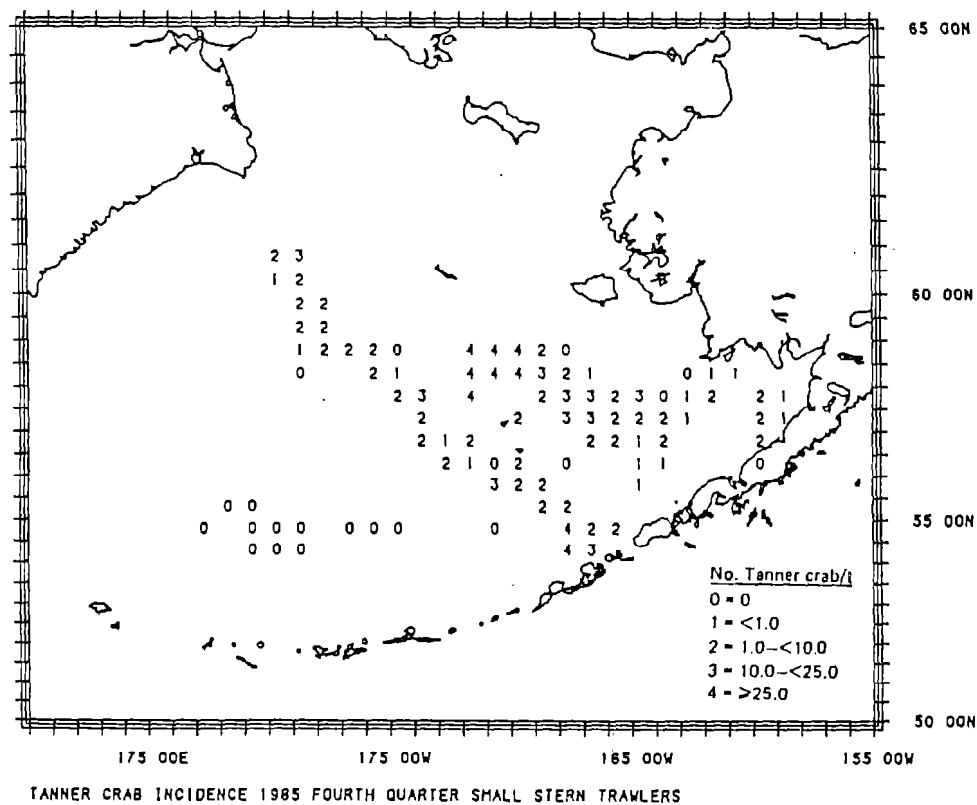
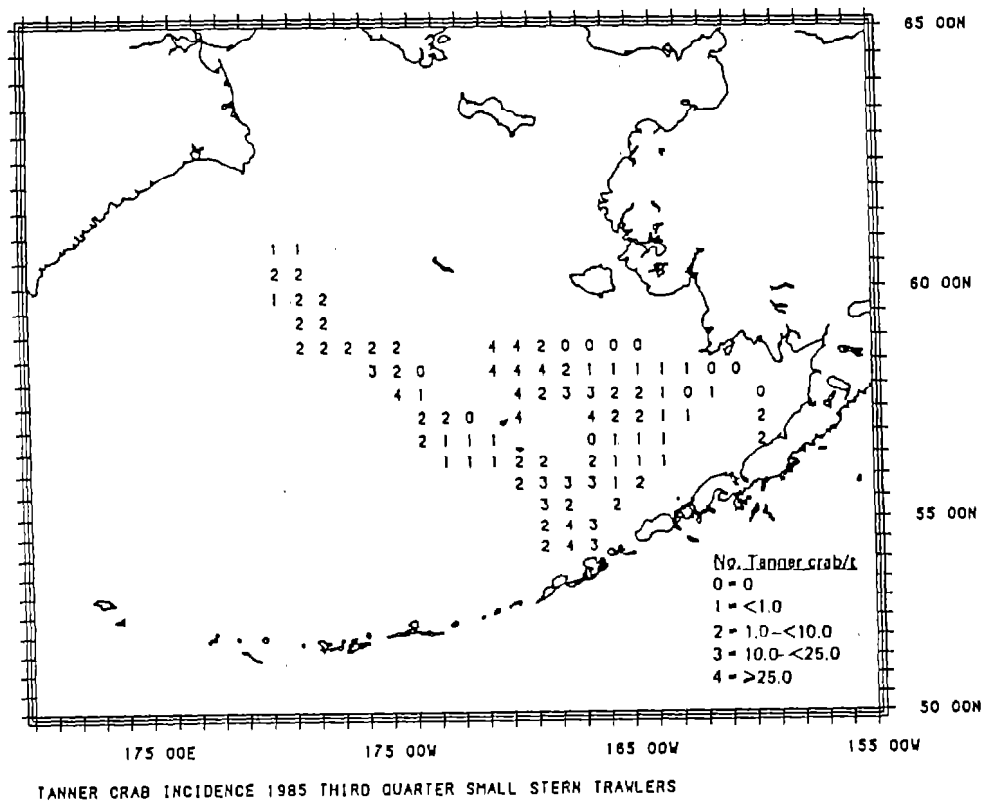


Figure B9 .--Continued.

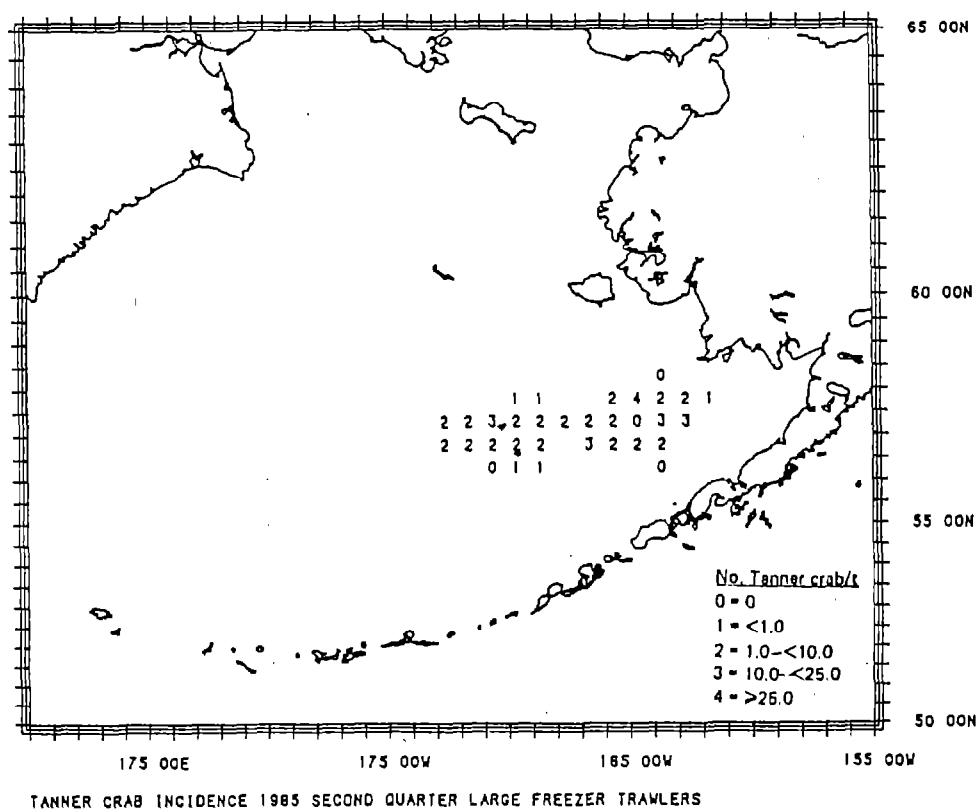
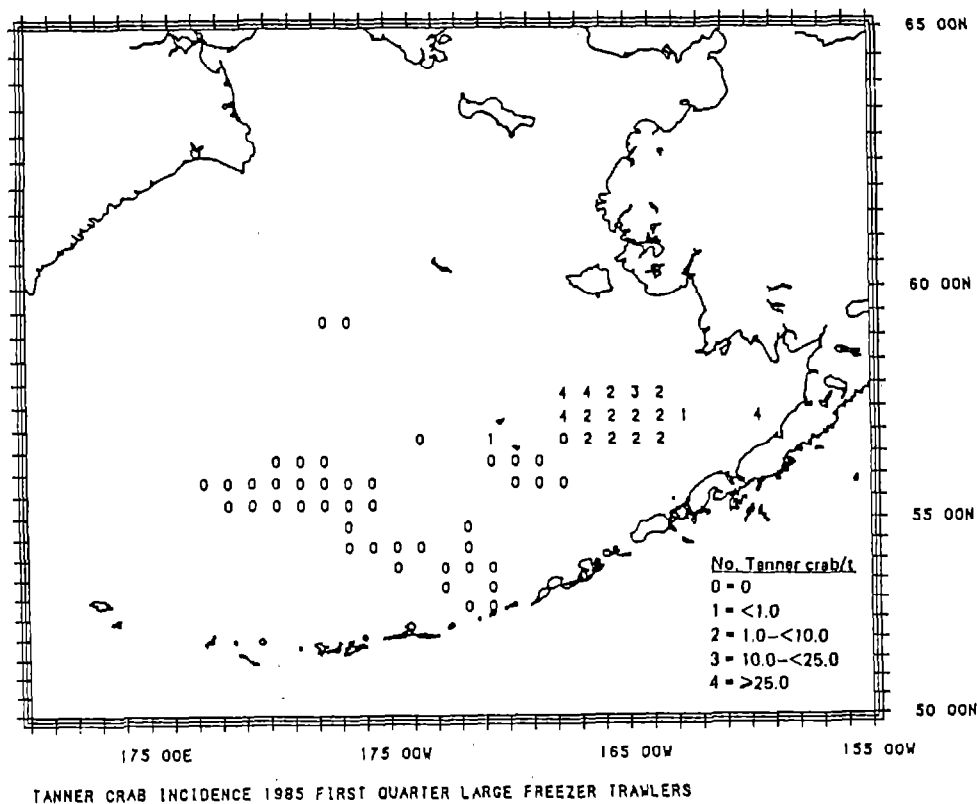
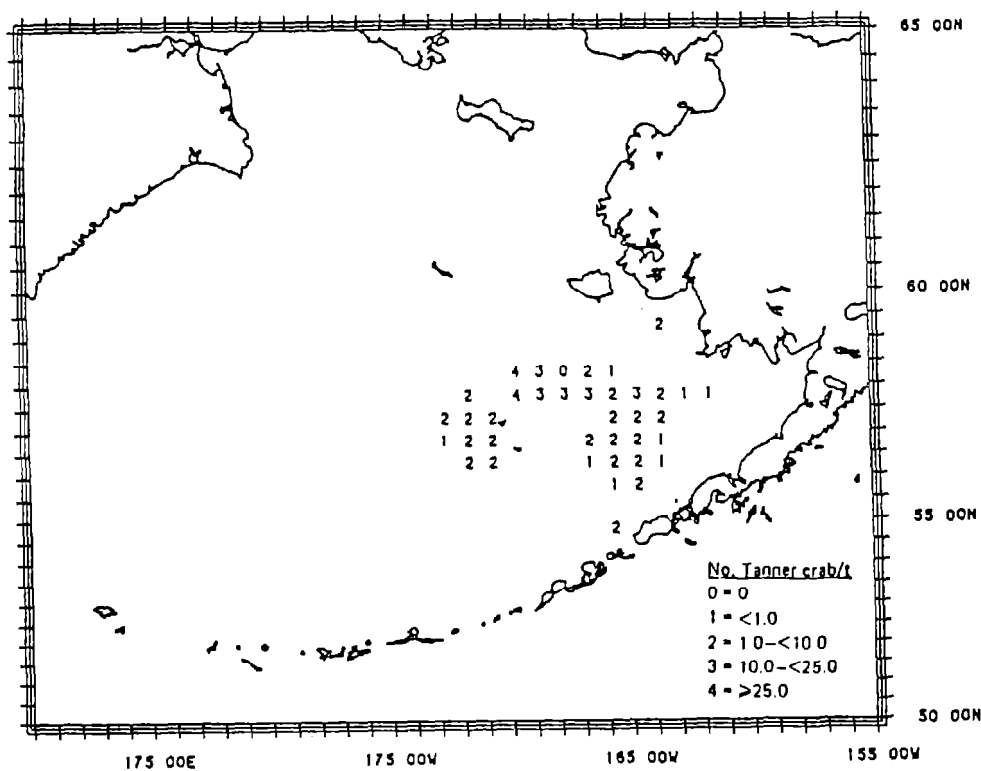
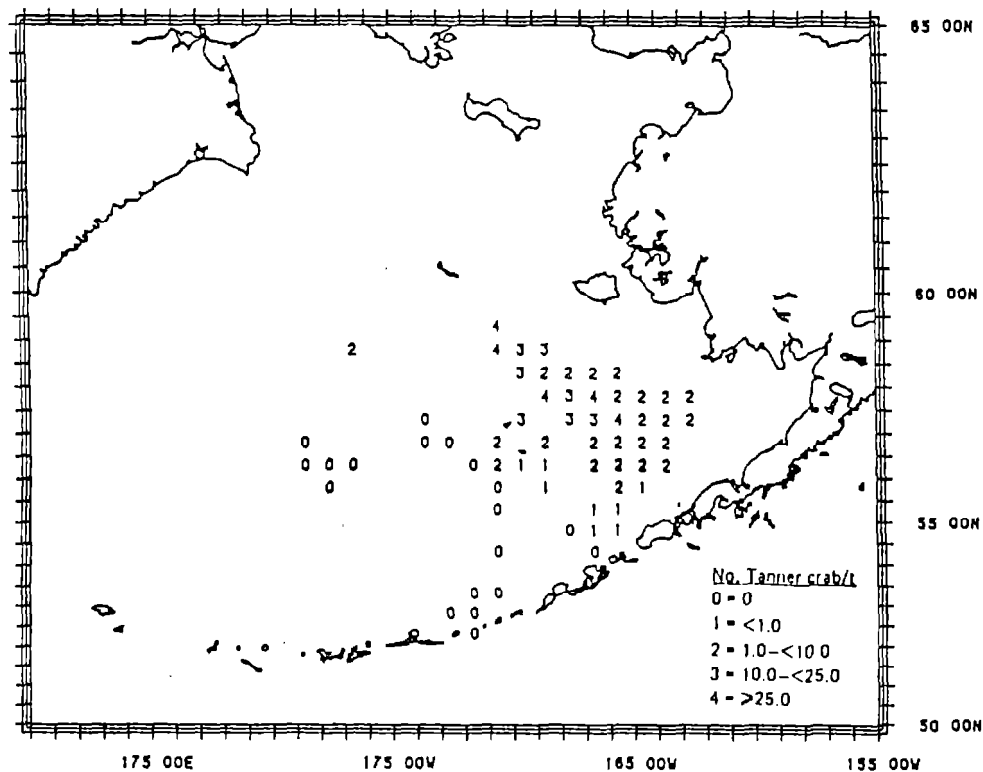


Figure B10. --Average incidence (no./t) of Tanner crab on large freezer trawlers (all nations) by quarter and 1/2° lat. by 1° long. areas, 1985.



TANNER CRAB INCIDENCE 1985 THIRD QUARTER LARGE FREEZER TRAWLERS



TANNER CRAB INCIDENCE 1985 FOURTH QUARTER LARGE FREEZER TRAWLERS

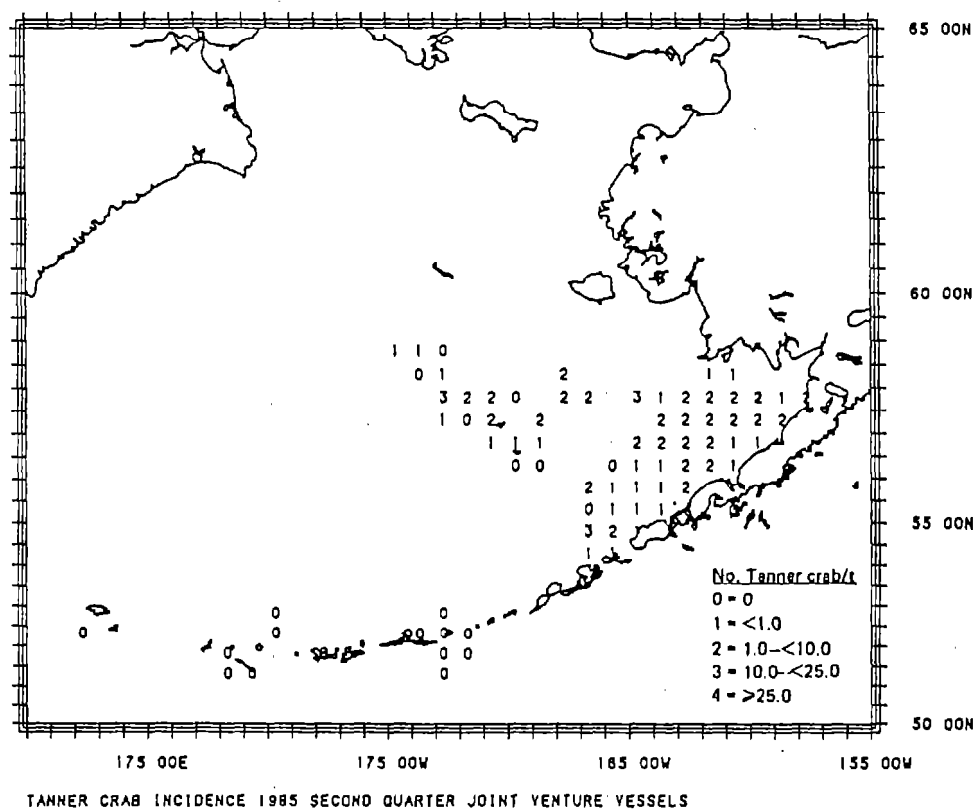
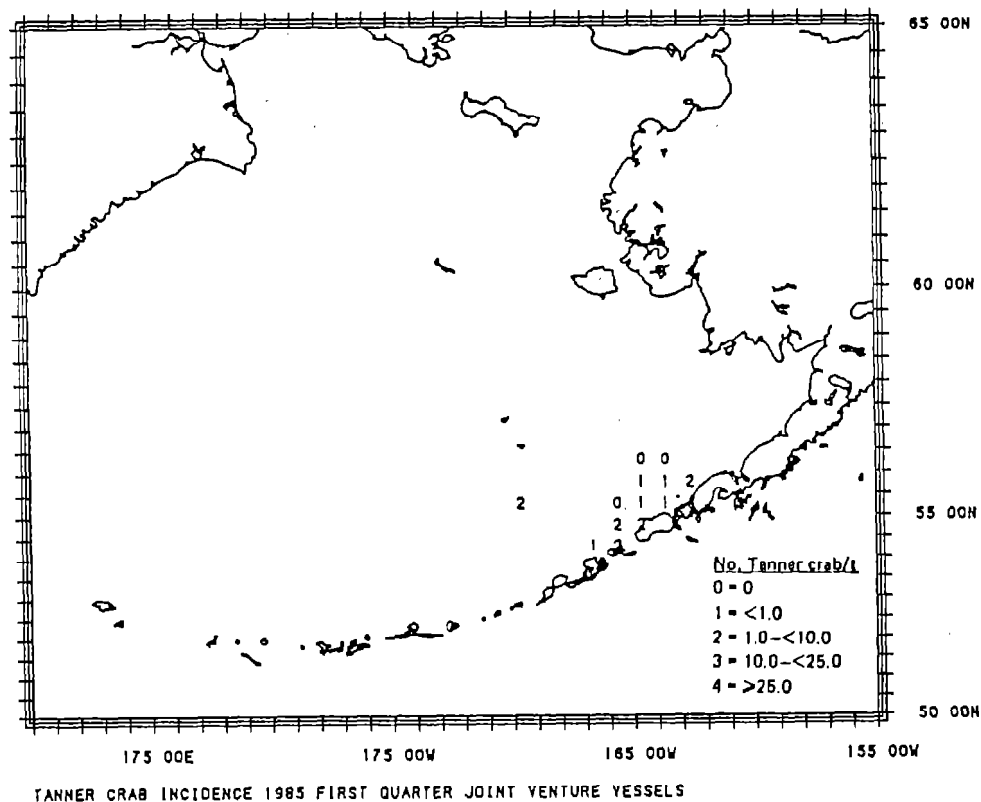


Figure B11. --Average incidence (no./t) of Tanner crab in the joint venture fisheries by quarter and 1/2° lat. by 1° long. areas, 1985.

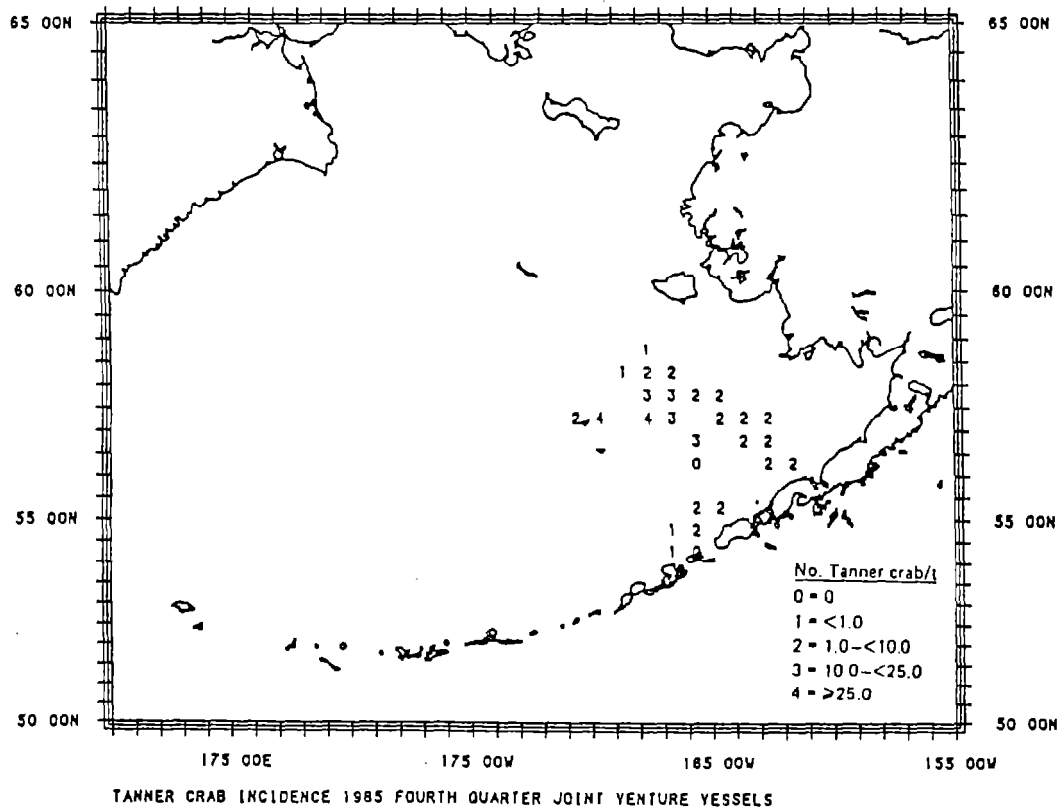
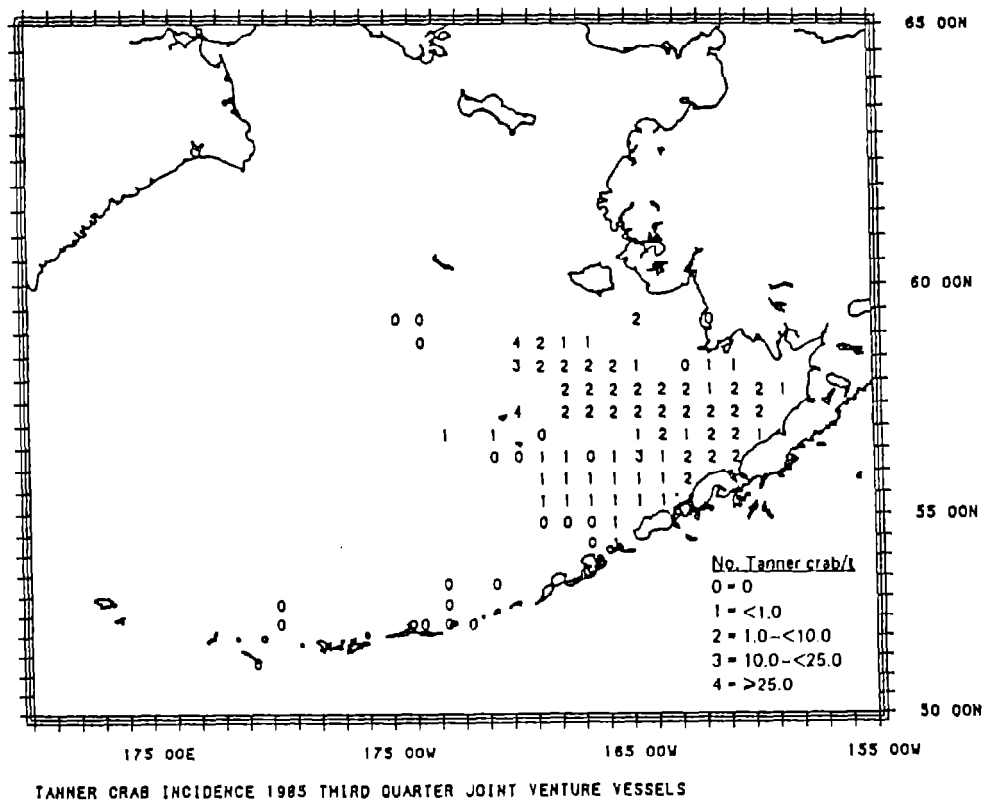


Figure B11 .--Continued.

Table B12.--Estimated incidental catches of Tanner crab (in numbers of crab and metric tons) by foreign groundfish and joint venture vessels in the Bering Sea/Aleutian region, 1985.

| | Number of crab | | | | | Weight (metric tons) | | | | |
|--------------------------------------|----------------|---------|----------|---------|-----------------|----------------------|---------|----------|---------|-----------------|
| | Area I | Area II | Area III | Area IV | Total all areas | Area I | Area II | Area III | Area IV | Total all areas |
| -----Foreign groundfish vessels----- | | | | | | | | | | |
| Japan | | | | | | | | | | |
| SMS | 1 | 13,017 | - | - | 13,018 | <0.01 | 1.51 | - | - | 1.51 |
| FMS | 33,249 | - | - | - | 33,249 | 2.57 | - | - | - | 2.57 |
| SST | 392,277 | 284,620 | - | 0 | 676,897 | 50.83 | 38.98 | - | 0.00 | 89.81 |
| LST | 9,107 | 62,186 | - | 0 | 71,293 | 1.90 | 6.10 | - | 0.00 | 8.00 |
| LFT | 153,381 | 41,701 | - | 0 | 195,082 | 15.64 | 3.56 | - | 0.00 | 19.20 |
| LL | 2,317 | 99,689 | - | 66 | 102,072 | 1.23 | 55.51 | - | 0.02 | 56.76 |
| Republic of Korea (ROK) | | | | | | | | | | |
| SST | 19,185 | 333 | - | 0 | 19,518 | 5.07 | 0.12 | - | 0.00 | 5.19 |
| LFT | 571,716 | 60,383 | - | 0 | 632,099 | 67.81 | 9.19 | - | 0.00 | 77.00 |
| Poland | | | | | | | | | | |
| LFT | 0 | 10 | - | 0 | 10 | 0.00 | 0.01 | - | 0.00 | 0.01 |
| U.S.S.R. | | | | | | | | | | |
| LFT | 14,282 | - | - | - | 14,282 | 3.23 | - | - | - | 3.23 |
| All nations total | 1,195,515 | 561,939 | - | 66 | 1,757,520 | 148.28 | 114.98 | - | 0.02 | 263.28 |
| Percent by area | 68.02 | 31.97 | - | <0.01 | | 56.32 | 43.67 | - | 0.01 | |
| -----Joint venture vessels----- | | | | | | | | | | |
| U.S.-Japan | 187,902 | 12,254 | - | - | 200,156 | 22.56 | 0.95 | - | - | 23.51 |
| U.S.-ROK | 173,969 | 18 | - | 0 | 173,987 | 39.24 | <0.01 | - | 0.00 | 39.24 |
| U.S.-Poland | 108 | - | - | 0 | 108 | 0.03 | - | - | 0.00 | 0.03 |
| U.S.-Portugal | 1,172 | - | - | - | 1,172 | 0.38 | - | - | - | 0.38 |
| U.S.-Taiwan | 2,316 | - | - | - | 2,316 | 0.23 | - | - | - | 0.23 |
| U.S.-U.S.S.R. | 513,698 | - | - | 0 | 513,698 | 71.03 | - | - | 0.00 | 71.03 |
| Joint venture totals | 879,165 | 12,272 | - | 0 | 891,437 | 133.47 | 0.95 | - | 0.00 | 134.42 |
| Percent by area | 98.62 | 1.38 | - | 0.00 | | 99.29 | 0.71 | - | 0.00 | |

SMS = Surimi motherships
FMS = Freezer motherships

SST = Small stern trawler
LST = Large surimi trawler

LFT = Large freezer trawler
LL = Longliner

Table B13.--Estimated incidental catches (numbers and metric tons) of Tanner crab (*Chionoecetes* spp.) in the foreign and joint venture groundfish fisheries in the Bering Sea/Aleutian Islands region, 1977-85.

| Year | Foreign | | Joint Venture | | Total | |
|------|---------------------|-------|---------------------|-----|---------------------|-------|
| | Millions of crab | t | Millions of crab | t | Millions of crab | t |
| 1977 | 17.6 | 3,728 | NF | NF | 17.6 | 3,728 |
| 1978 | 17.3 | 4,267 | NF | NF | 17.3 | 4,267 |
| 1979 | 18.0 | 3,654 | NF | NF | 18.0 | 3,654 |
| 1980 | 11.1 | 2,058 | 0.3 | 56 | 11.4 | 2,114 |
| 1981 | 5.6 | 1,196 | 0.7 | 276 | 6.3 | 1,472 |
| 1982 | 2.3 | 425 | 0.1 | 24 | 2.4 | 448 |
| 1983 | 2.5 | 501 | 0.5 | 171 | 3.0 | 672 |
| 1984 | 2.6 | 527 | 0.4 | 119 | 3.0 | 646 |
| 1985 | 1.8 | 263 | 0.9 | 134 | 2.7 | 397 |

1/ Estimated catches for years 1977-84 from Berger et al., 1985.

NF = no fishing.

Table B14.--Biological data on the incidental catch of Tanner crab in the foreign and joint venture groundfish fishery in the Bering Sea/Aleutian Islands region, 1985.

| Species | Percent by species | Sex | Sex composition | Average weight (kg) | Average carapace width (mm) |
|---|-----------------------|----------|--------------------|------------------------|-----------------------------------|
| -----Foreign directed fisheries----- | | | | | |
| <u>Chionoecetes</u> <u>bairdi</u> | 19.63 | Male | 65.54 | 0.20 | 76 |
| | | Female | 32.36 | 0.11 | 70 |
| | | Unsexed | 2.10 | 0.06 | 51 |
| | | Combined | | 0.17 | 73 |
| <u>Chionoecetes</u> <u>opilio</u> | 65.40 | Male | 86.64 | 0.25 | 81 |
| | | Female | 12.89 | 0.07 | 51 |
| | | Unsexed | 0.46 | 0.22 | 75 |
| | | Combined | | 0.23 | 77 |
| <u>Chionoecetes</u> <u>tanneri</u> | 2.07 | Male | 76.94 | 0.68 | 119 |
| | | Female | 22.88 | 0.28 | 101 |
| | | Unsexed | 0.19 | 0.27 | 116 |
| | | Combined | | 0.59 | 115 |
| <u>Chionoecetes</u> <u>angulatus</u> | 12.91 | Male | 74.68 | 0.28 | 96 |
| | | Female | 25.14 | 0.11 | 71 |
| | | Unsexed | 0.18 | 0.15 | 92 |
| | | Combined | | 0.24 | 90 |
| -----Joint venture fisheries----- | | | | | |
| <u>Chionoecetes</u> <u>bairdi</u> | 60.78 | Male | 66.82 | 0.31 | 86 |
| | | Female | 32.41 | 0.13 | 63 |
| | | Unsexed | 0.77 | 0.19 | 116 |
| | | Combined | | 0.25 | 79 |
| <u>Chionoecetes</u> <u>opilio</u> | 38.98 | Male | 86.61 | 0.22 | 72 |
| | | Female | 12.53 | 0.08 | 49 |
| | | Unsexed | 0.86 | 0.07 | 88 |
| | | Combined | | 0.20 | 69 |
| <u>Chionoecetes</u> <u>tanneri</u> | 0.21 | Male | 98.76 | 0.43 | 113 |
| | | Female | 1.24 | 0.18 | 80 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 0.42 | 112 |
| <u>Chionoecetes</u> <u>angulatus</u> | 0.02 | Male | 57.91 | 0.21 | 70 |
| | | Female | 42.09 | 0.23 | 76 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 0.22 | 72 |

Table B15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Surimi Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | NS | NS | <0.001 | 1.513 | -- | -- | -- | -- |
| AUG. | -- | -- | <0.001 | 0.800 | -- | -- | -- | -- |
| SEPT. | -- | -- | 0.000 | 0.000 | -- | -- | -- | -- |
| OCT. | -- | -- | 0.001 | 1.433 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | NS | NS | <0.001 | 1.399 | -- | -- | -- | -- |
| -----Japanese Freezer Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | 0.116 | 0.856 | -- | -- | -- | -- | -- | -- |
| AUG. | 0.199 | 1.005 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.541 | 0.937 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.447 | 1.075 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.008 | 1.696 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.310 | 0.992 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Small Trawler----- | | | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| FEB. | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | 0.021 | 2.256 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| APRIL | 0.032 | 2.210 | 1.877 | 0.446 | -- | -- | 0.000 | 0.000 |
| MAY | 2.437 | 0.912 | 3.017 | 0.448 | -- | -- | -- | -- |
| JUNE | 2.153 | 1.084 | 1.152 | 0.507 | -- | -- | -- | -- |
| JULY | 0.536 | 1.359 | 2.041 | 0.334 | -- | -- | -- | -- |
| AUG. | 0.892 | 0.875 | 0.928 | 0.642 | -- | -- | -- | -- |
| SEPT. | 2.068 | 0.425 | 1.344 | 0.685 | -- | -- | -- | -- |
| OCT. | 0.369 | 1.725 | 1.043 | 1.054 | -- | -- | -- | -- |
| NOV. | 1.243 | 0.215 | 0.665 | 0.993 | -- | -- | -- | -- |
| DEC. | 2.544 | 0.253 | 0.780 | 1.106 | 0.000 | 0.000 | -- | -- |
| ANNUAL | 1.365 | 0.637 | 1.006 | 0.640 | 0.000 | 0.000 | 0.000 | 0.000 |
| -----Japanese Large Freezer Trawler----- | | | | | | | | |
| JAN. | 0.120 | 1.833 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| FEB. | 0.004 | 1.520 | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | 0.027 | 2.062 | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| APRIL | 0.031 | 2.504 | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.062 | 1.659 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.029 | 2.058 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.050 | 2.407 | 0.023 | 3.198 | -- | -- | -- | -- |
| DEC. | 0.023 | 2.206 | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.032 | 2.117 | 0.020 | 3.198 | 0.000 | 0.000 | 0.000 | 0.000 |

*Exclusive Economic Zone

Table B15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Surimi Large Trawler----- | | | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| FEB. | -- | -- | 0.001 | 1.273 | -- | -- | 0.000 | 0.000 |
| MARCH | -- | -- | 0.003 | 1.041 | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | 11.983 | 0.565 | -- | -- | -- | -- | -- | -- |
| JULY | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| AUG. | 0.000 | 0.000 | 0.001 | 1.700 | -- | -- | -- | -- |
| SEPT. | 0.004 | 1.382 | 0.003 | 1.441 | -- | -- | -- | -- |
| OCT. | <0.001 | 1.403 | 0.006 | 1.435 | -- | -- | -- | -- |
| NOV. | <0.001 | 0.814 | 0.005 | 1.608 | -- | -- | -- | -- |
| DEC. | 0.020 | 2.817 | 0.002 | 1.382 | 0.000 | 0.000 | -- | -- |
| ANNUAL | 0.003 | 0.724 | 0.003 | 1.443 | 0.000 | 0.000 | 0.000 | 0.000 |
| -----Japanese Longliners Fishing <500 M----- | | | | | | | | |
| JAN. | NS | NS | 0.000 | 0.000 | -- | -- | -- | -- |
| FEB. | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| MARCH | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| APRIL | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| MAY | NS | NS | NS | NS | NS | NS | -- | -- |
| JUNE | -- | -- | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | -- | -- | NS | NS | -- | -- | -- | -- |
| AUG. | -- | -- | 0.004 | 2.000 | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | 0.015 | 1.600 | NS | NS | -- | -- |
| NOV. | 0.105 | 0.912 | 0.010 | 1.409 | 0.091 | 1.100 | -- | -- |
| DEC. | 0.000 | 0.000 | 0.014 | 1.300 | 0.802 | 0.957 | -- | -- |
| ANNUAL | 0.020 | 0.912 | 0.009 | 1.439 | 0.722 | 0.959 | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table BLS.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Longliners Fishing >500 M----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | 0.647 | 0.818 | -- | -- |
| ANNUAL | -- | -- | -- | -- | 0.647 | 0.818 | -- | -- |
| -----U.S.S.R. Large Freezer Trawler----- | | | | | | | | |
| JAN. | 5.089 | 0.697 | -- | -- | -- | -- | -- | -- |
| FEB. | 4.773 | 0.731 | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 5.073 | 0.699 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

Table B15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
 Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Polish Large Freezer Trawler----- | | | | | | | | |
| JAN. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| FEB. | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| MARCH | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | -- | -- | NS | NS | -- | -- |
| NOV. | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 | -- | -- |
| DEC. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| ANNUAL | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| -----Republic of Korea Small Trawler----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | NS | NS | 0.000 | 0.000 | -- | -- |
| MARCH | 0.024 | 1.103 | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| APRIL | 2.238 | 1.069 | -- | -- | -- | -- | -- | -- |
| MAY | 2.662 | 1.400 | 0.000 | 0.000 | -- | -- | -- | -- |
| JUNE | 0.832 | 1.742 | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | 1.321 | 1.237 | 0.000 | 0.000 | -- | -- | -- | -- |
| AUG. | 0.461 | 1.318 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.394 | 1.657 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.223 | 1.450 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.179 | 1.227 | -- | -- | -- | -- | -- | -- |
| DEC. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.500 | 1.397 | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
 Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Republic of Korea Large Freezer Trawler----- | | | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| FEB. | NS | NS | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| APRIL | 0.163 | 1.290 | 0.003 | 2.300 | -- | -- | -- | -- |
| MAY | 1.344 | 0.803 | 0.000 | 0.000 | -- | -- | -- | -- |
| JUNE | 0.427 | 1.099 | 0.001 | 0.825 | -- | -- | -- | -- |
| JULY | 0.407 | 1.139 | 0.001 | 1.000 | -- | -- | -- | -- |
| AUG. | 0.438 | 1.303 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.654 | 1.256 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.189 | 1.580 | 0.000 | 0.000 | -- | -- | -- | -- |
| NOV. | 0.167 | 1.022 | 0.000 | 0.000 | -- | -- | -- | -- |
| DEC. | 0.110 | 1.414 | 0.001 | 0.600 | -- | -- | -- | -- |
| ANNUAL | 0.338 | 1.154 | 0.001 | 1.095 | 0.000 | 0.000 | 0.000 | 0.000 |
| -----U.S.-U.S.S.R. JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| MARCH | 0.294 | 0.648 | -- | -- | -- | -- | -- | -- |
| APRIL | 7.003 | 0.632 | -- | -- | 0.001 | 2.600 | -- | -- |
| MAY | 4.017 | 0.756 | -- | -- | 0.002 | 1.864 | -- | -- |
| JUNE | 6.662 | 0.726 | -- | -- | 0.013 | 1.964 | -- | -- |
| JULY | 5.725 | 0.591 | -- | -- | 0.001 | 1.529 | -- | -- |
| AUG. | 1.687 | 0.374 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.397 | 0.888 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.250 | 1.805 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.014 | 1.094 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 3.313 | 0.653 | -- | -- | 0.005 | 1.936 | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no fishing by U.S. observers.

Table B15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Republic of Korea JV Mothership----- | | | | | | | | |
| JAN. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| FEB. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| MARCH | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 | -- | -- |
| APRIL | 1.467 | 0.870 | -- | -- | 0.003 | 2.550 | -- | -- |
| MAY | 10.946 | 0.895 | NS | NS | 0.006 | 1.411 | -- | -- |
| JUNE | 4.638 | 0.563 | -- | -- | 0.014 | 1.522 | -- | -- |
| JULY | 4.896 | 0.849 | 0.000 | 0.000 | 0.006 | 0.325 | -- | -- |
| AUG. | 7.655 | 0.745 | NS | NS | -- | -- | -- | -- |
| SEPT. | 2.804 | 0.917 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.436 | 1.001 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.175 | 1.680 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 4.614 | 0.770 | 0.000 | 0.000 | 0.007 | 1.329 | -- | -- |
| -----U.S.-Japan JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | 0.007 | 0.690 | -- | -- | -- | -- | -- | -- |
| APRIL | 0.073 | 0.252 | -- | -- | -- | -- | -- | -- |
| MAY | 2.941 | 0.813 | -- | -- | -- | -- | -- | -- |
| JUNE | 3.131 | 0.657 | 0.003 | 2.138 | -- | -- | -- | -- |
| JULY | 0.375 | 0.585 | 0.000 | 0.000 | -- | -- | -- | -- |
| AUG. | 0.522 | 0.205 | 0.000 | 0.000 | -- | -- | -- | -- |
| SEPT. | 0.128 | 0.825 | 0.000 | 0.000 | -- | -- | -- | -- |
| OCT. | 2.031 | 1.282 | 0.952 | 1.450 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.458 | 0.588 | 0.004 | 1.880 | -- | -- | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
 Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|-------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Poland JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| MAY | 0.071 | 1.176 | -- | -- | -- | -- | -- | -- |
| JUNE | 0.103 | 1.349 | -- | -- | -- | -- | -- | -- |
| JULY | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 | -- | -- |
| AUG. | 0.043 | 1.139 | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| NOV. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.032 | 1.191 | -- | -- | 0.000 | 0.000 | -- | -- |
| -----U.S.-Taiwan JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | 2.541 | 1.534 | -- | -- | -- | -- | -- | -- |
| JULY | 2.104 | 0.919 | -- | -- | -- | -- | -- | -- |
| AUG. | 1.483 | 0.221 | -- | -- | -- | -- | -- | -- |
| SEPT. | NS | NS | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 2.177 | 1.196 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

NS = Fishing occurred but no sampling by U.S. observers.

Table B15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Bering Sea, 1985. (Continued)
 Lines indicate areas not fished.

| | AREA I | | AREA II | | AREA IV | | OUTSIDE EEZ* | |
|---------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|--------------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Portugal JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| MARCH | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.000 | 0.000 | -- | -- | -- | -- | -- | -- |

*Exclusive Economic Zone

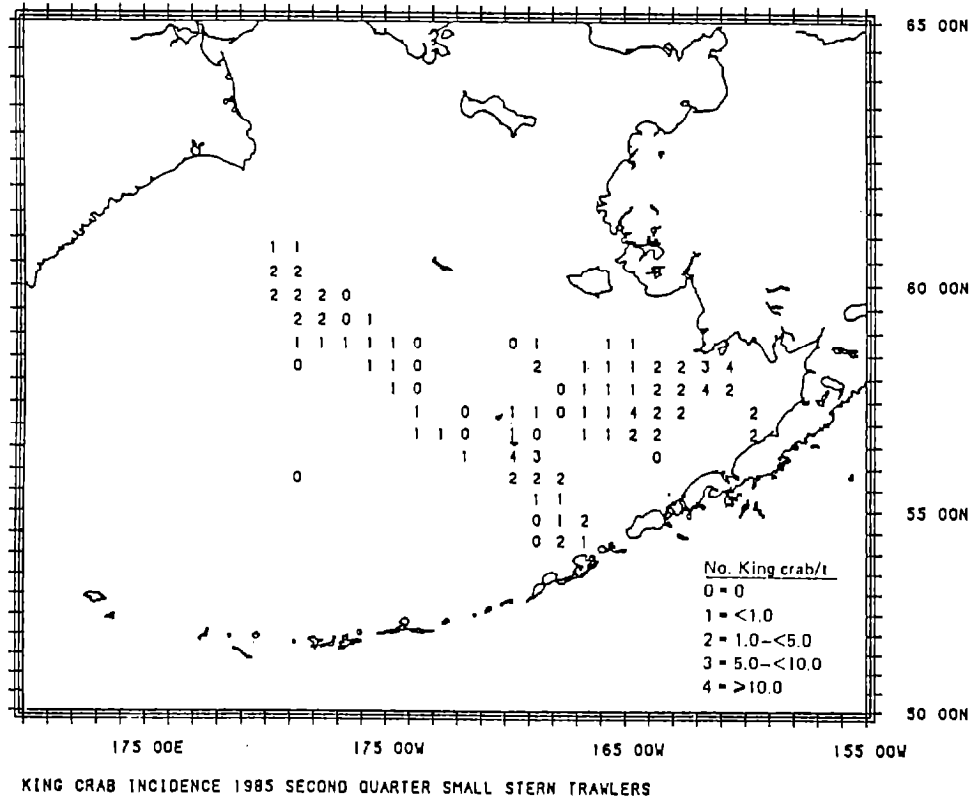
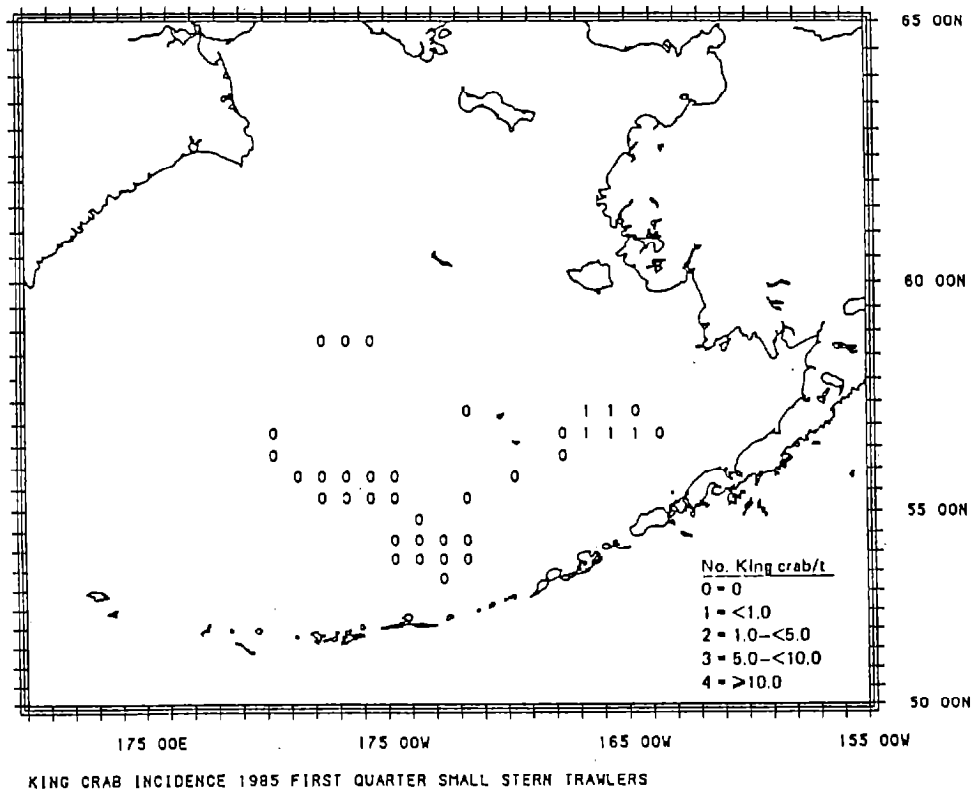


Figure B12. --Average incidence (no./t) of king crab on small stern trawlers (all nations) by quarter and 1/2° lat. by 1° long. areas, 1985.

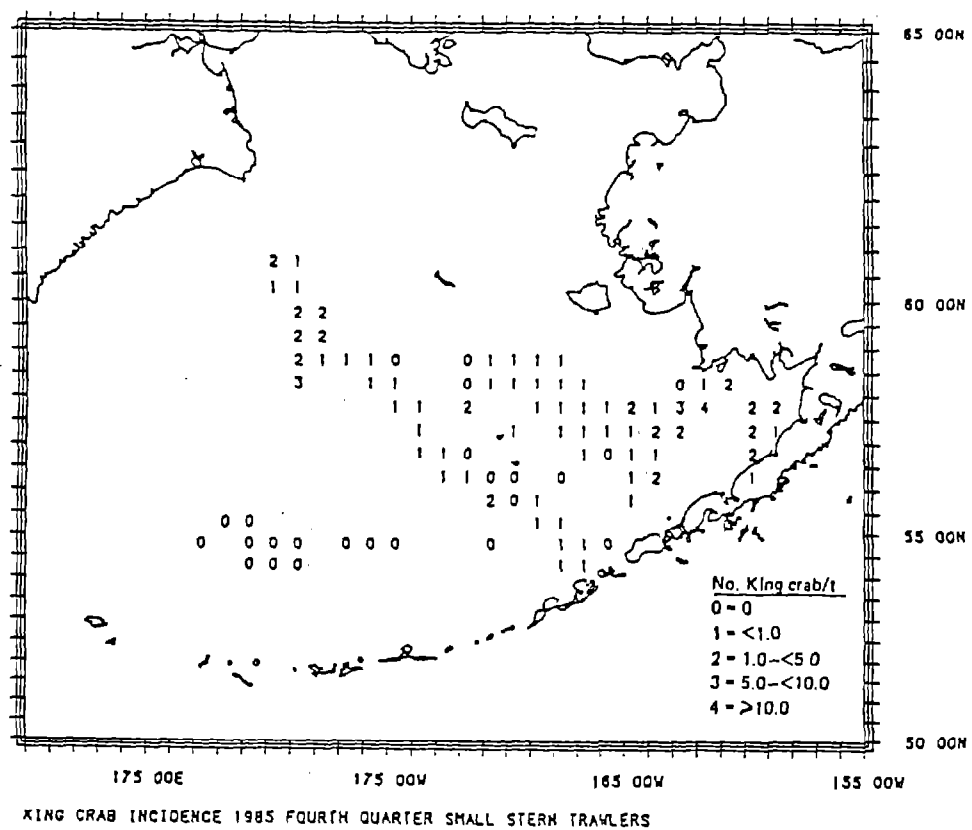
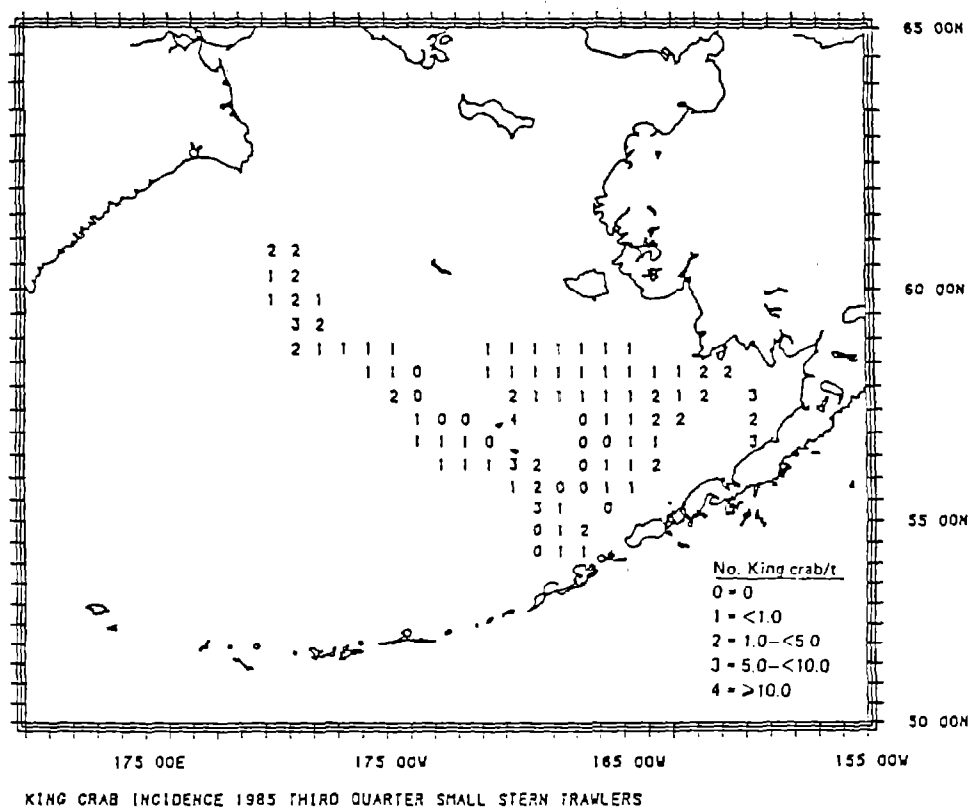


Figure B12.--Continued.

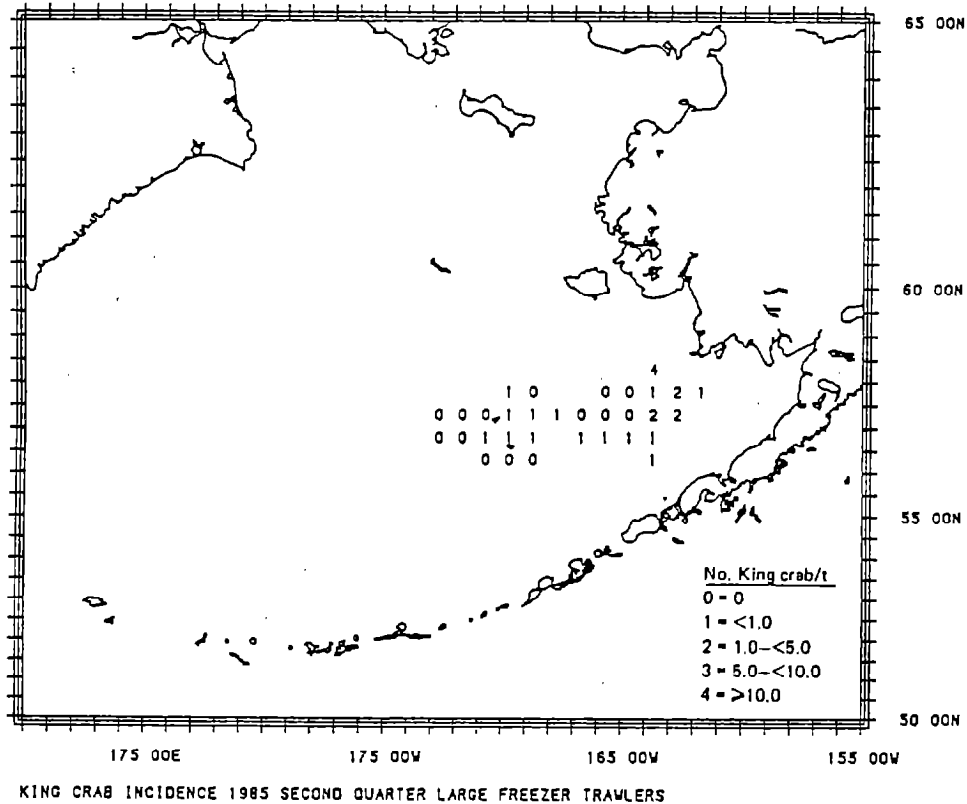
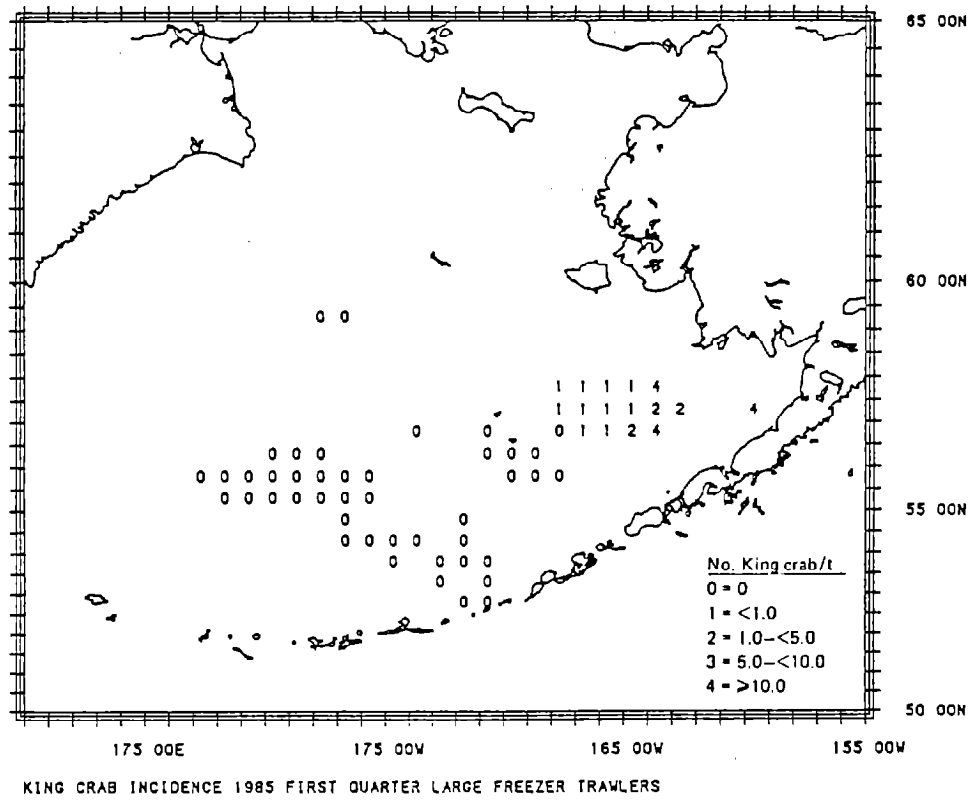


Figure B13 ---Average incidence (no./t) of king crab on large freezer trawlers (all nations) by quarter and 1/2° lat. by 1° long. areas, 1985.

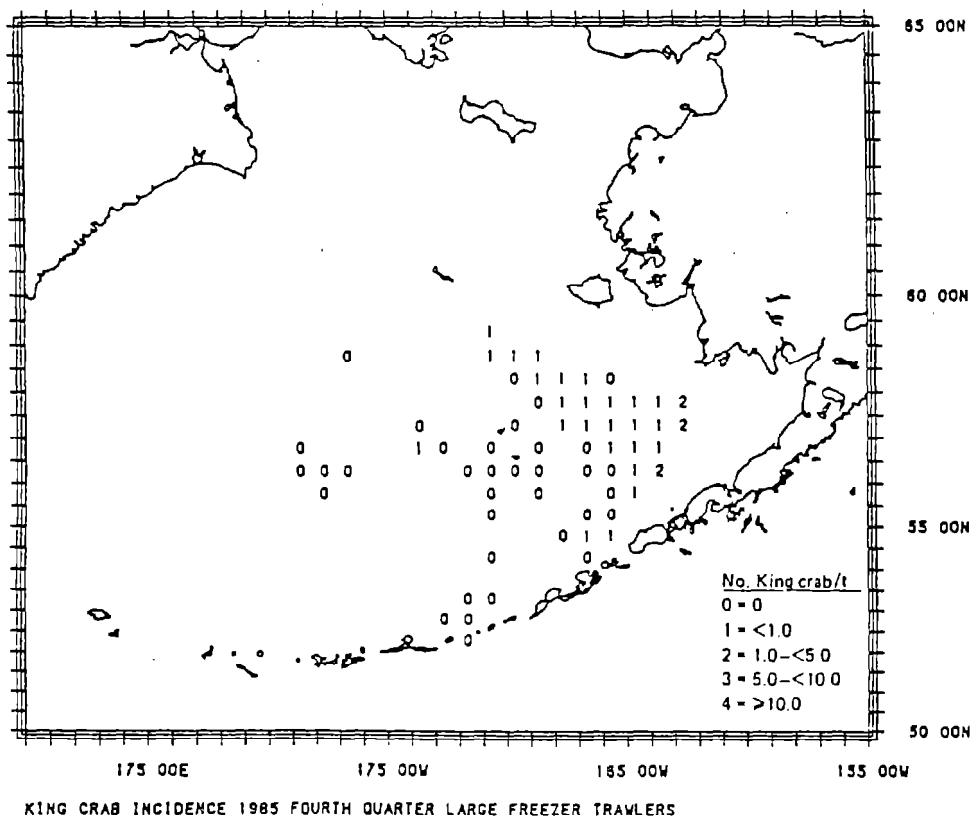
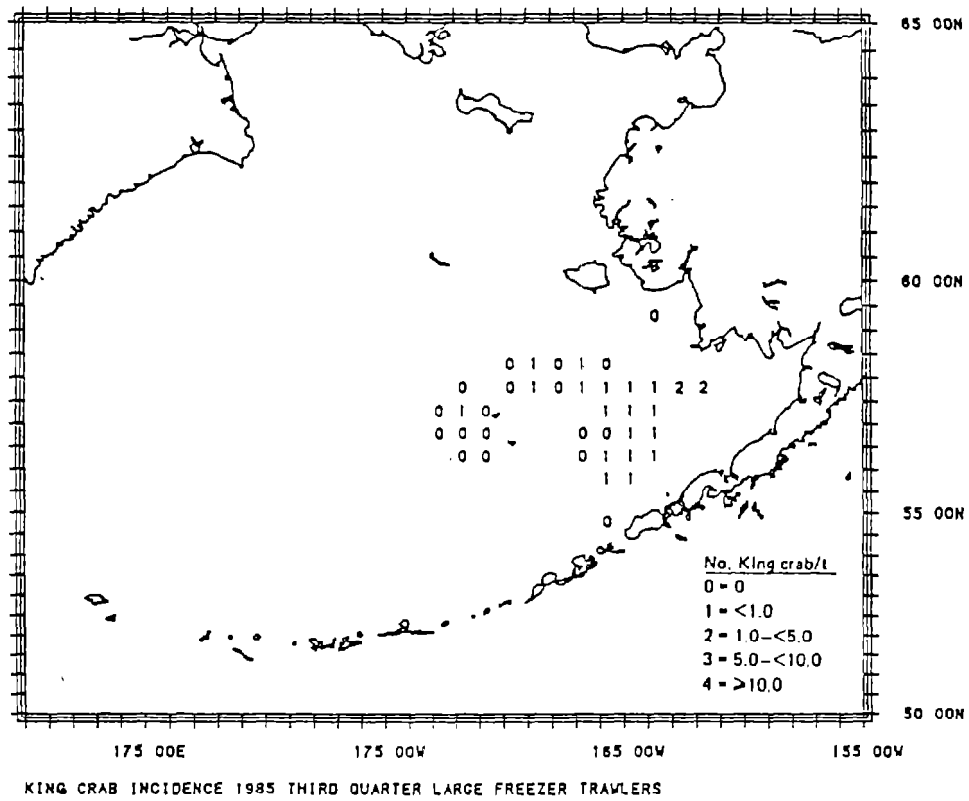


Figure B13 .--Continued.

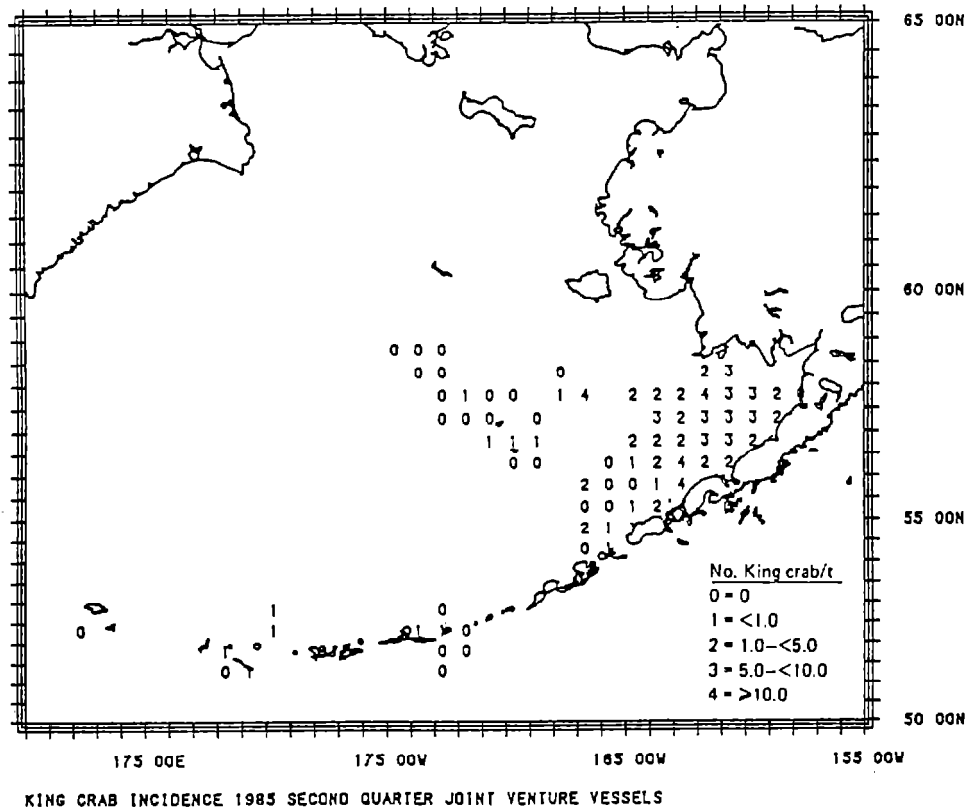
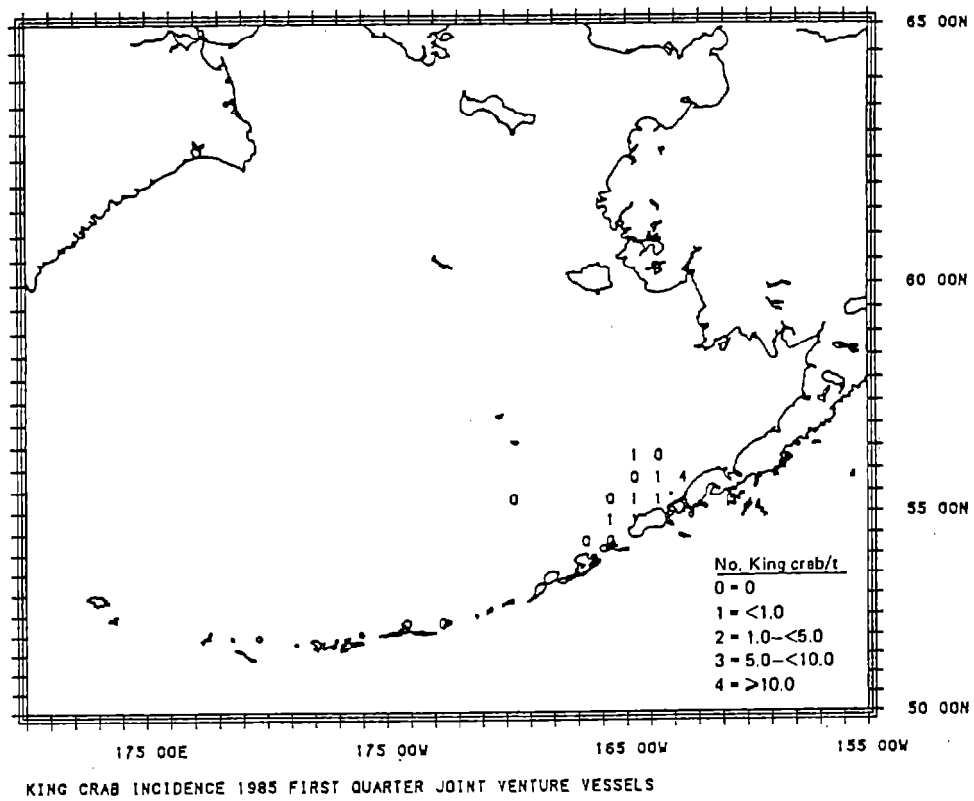


Figure B14.--Average incidence (no./t) of king crab in the joint venture fisheries by quarter and 1/2° lat. by 1° long. areas, 1985.

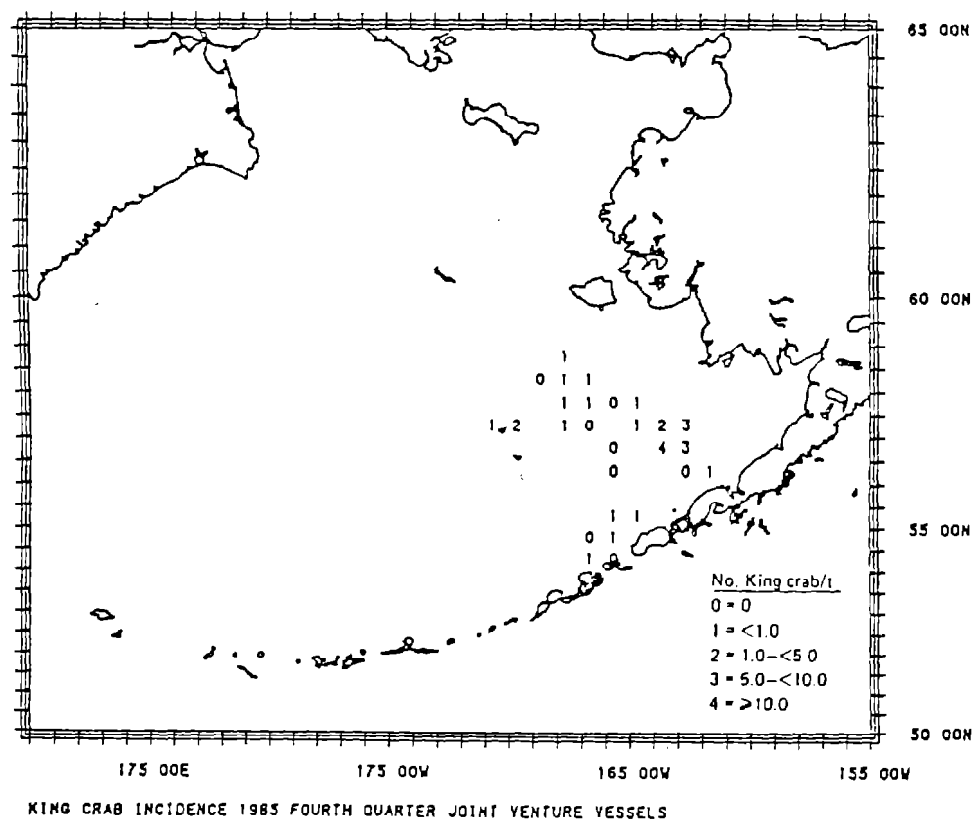
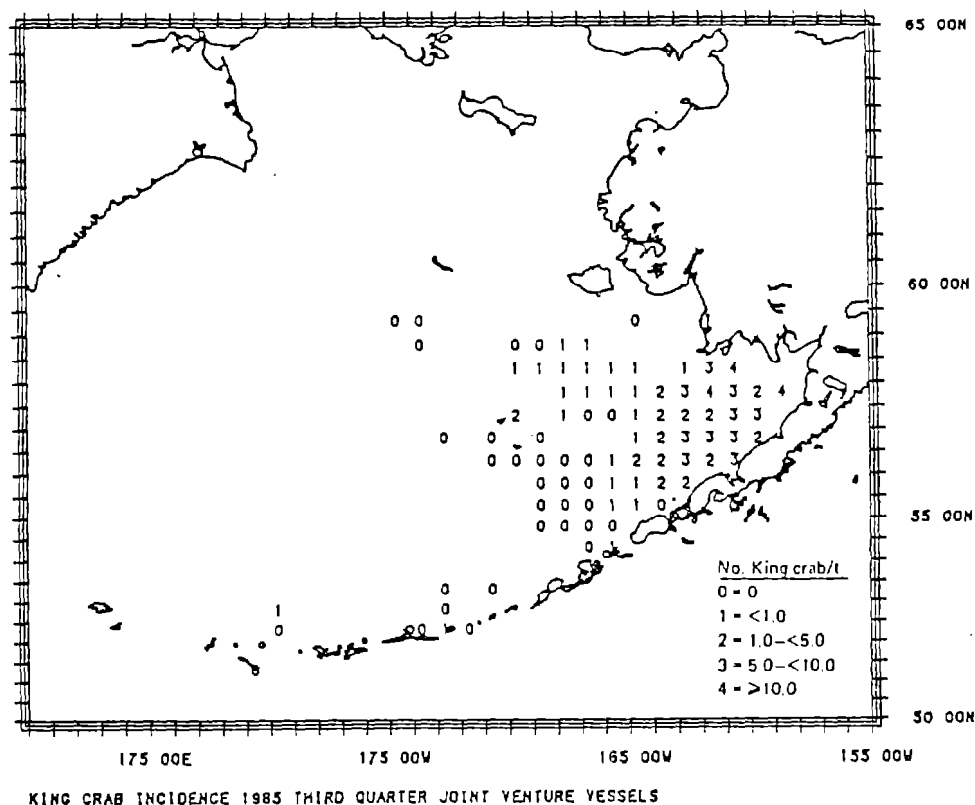


Figure B14.--Continued.

Table B16.--Estimated incidental catches of king crab (in numbers of crab and metric tons) by foreign groundfish and joint venture vessels in the Bering Sea/Aleutian region, 1985.

| | Number of crab | | | | | Weight (metric tons) | | | | |
|--------------------------------------|----------------|------------|-------------|------------|--------------------|----------------------|------------|-------------|------------|--------------------|
| | Area I | Area II | Area III | Area IV | Total all areas | Area I | Area II | Area III | Area IV | Total all areas |
| -----Foreign groundfish vessels----- | | | | | | | | | | |
| Japan | | | | | | | | | | |
| SMS | 0 | 114 | - | - | 114 | 0.00 | 0.16 | - | - | 0.16 |
| FMS | 10,794 | - | - | - | 10,794 | 10.75 | - | - | - | 10.75 |
| SST | 45,026 | 40,059 | - | 0 | 85,085 | 31.21 | 25.23 | - | 0.00 | 56.44 |
| LST | 731 | 323 | - | 0 | 1,054 | 0.45 | 0.45 | - | 0.00 | 0.90 |
| LFT | 554 | 8 | - | 0 | 562 | 1.19 | 0.03 | - | 0.00 | 1.22 |
| LL | 78 | 290 | - | 721 | 1,089 | 0.07 | 0.42 | - | 0.68 | 1.17 |
| Republic of Korea (ROK) | | | | | | | | | | |
| SST | 7,789 | 0 | - | 0 | 7,789 | 10.73 | 0.00 | - | 0.00 | 10.73 |
| LFT | 59,145 | 21 | - | 0 | 59,166 | 72.27 | 0.02 | - | 0.00 | 72.29 |
| Poland | | | | | | | | | | |
| LFT | 0 | 0 | - | 0 | 0 | 0.00 | 0.00 | - | 0.00 | 0.00 |
| U.S.S.R. | | | | | | | | | | |
| LFT | 54,130 | - | - | - | 54,130 | 37.77 | - | - | - | 37.77 |
| All nations total | 178,247 | 40,815 | - | 721 | 219,783 | 164.44 | 26.31 | - | 0.68 | 191.43 |
| Percent by area | 81.10 | 18.57 | - | 0.33 | | 85.90 | 13.74 | - | 0.36 | |
| -----Joint venture vessels----- | | | | | | | | | | |
| U.S.-Japan | 140,988 | 30 | - | - | 141,018 | 80.20 | 0.06 | - | - | 80.26 |
| U.S.-ROK | 275,719 | 0 | - | 243 | 275,962 | 211.78 | 0.00 | - | 0.32 | 212.10 |
| U.S.-Poland | 370 | - | - | 0 | 370 | 0.44 | - | - | 0.00 | 0.44 |
| U.S.-Portugal | 0 | - | - | - | 0 | 0.00 | - | - | - | 0.00 |
| U.S.-Taiwan | 775 | - | - | - | 775 | 0.96 | - | - | - | 0.96 |
| U.S.-U.S.S.R. | 587,068 | - | - | 97 | 587,165 | 384.00 | - | - | 0.19 | 384.19 |
| Joint venture totals | 1,004,920 | 30 | - | 340 | 1,005,290 | 677.38 | 0.06 | - | 0.51 | 677.95 |
| Percent by area | 99.96 | <0.01 | - | 0.03 | | 99.92 | 0.01 | - | 0.08 | |

SMS = Surimi motherships
FMS = Freezer motherships

SST = Small stern trawler
LST = Large surimi trawler

LFT = Large freezer trawler
LL = Longliner

Table B17.--Estimated incidental catches (numbers and metric tons) of King crab (Lithodes and Paralithodes spp.) in the foreign and joint venture groundfish fisheries in the Bering Sea/Aleutian Islands region, 1977-85

| Year | Foreign | | Joint Venture | | Total | |
|------|-----------|-------|---------------|-----|-----------|-------|
| | Nos. | t | Nos. | t | Nos. | t |
| 1977 | 599,623 | 641 | NF | NF | 599,623 | 641 |
| 1978 | 1,277,931 | 1,097 | NF | NF | 1,277,931 | 1,097 |
| 1979 | 1,007,796 | 1,008 | NF | NF | 1,007,796 | 1,008 |
| 1980 | 858,129 | 781 | 289,542 | 241 | 1,147,671 | 1,022 |
| 1981 | 733,026 | 666 | 1,084,126 | 642 | 1,817,152 | 1,308 |
| 1982 | 380,004 | 343 | 193,915 | 90 | 573,919 | 433 |
| 1983 | 404,013 | 353 | 630,144 | 337 | 1,034,157 | 690 |
| 1984 | 292,223 | 309 | 398,865 | 283 | 691,088 | 592 |
| 1985 | 219,783 | 191 | 1,005,290 | 678 | 1,225,073 | 869 |

1/ Estimated catches for years 1977-84 from Berger et al., 1985.

NF = no fishing.

Table B18 .--Biological data on the incidental catch of king crab in the foreign and joint venture groundfish fishery in the Bering Sea/Aleutian Islands region, 1985.

| Species | Percent by species | Sex | Sex composition | Average weight (kg) | Average carapace length (mm) |
|--------------------------------------|-----------------------|----------|--------------------|------------------------|------------------------------------|
| -----Foreign directed fisheries----- | | | | | |
| Blue | 2.21 | Male | 44.11 | 1.53 | 142 |
| | | Female | 55.23 | 1.15 | 120 |
| | | Unsexed | 0.66 | 2.55 | 133 |
| | | Combined | | 1.33 | 130 |
| Red | 77.36 | Male | 78.67 | 1.17 | 120 |
| | | Female | 17.36 | 0.50 | 94 |
| | | Unsexed | 3.97 | 0.96 | 111 |
| | | Combined | | 1.05 | 115 |
| Golden | 19.69 | Male | 48.82 | 0.96 | 120 |
| | | Female | 51.01 | 0.62 | 107 |
| | | Unsexed | 0.17 | 0.90 | 119 |
| | | Combined | | 0.79 | 113 |
| Couesi | 0.74 | Male | 85.71 | 0.44 | 122 |
| | | Female | 13.01 | 0.40 | 104 |
| | | Unsexed | 1.28 | 1.19 | 115 |
| | | Combined | | 0.44 | 120 |
| -----Joint venture fisheries----- | | | | | |
| Blue | 0.62 | Male | 64.59 | 1.41 | 144 |
| | | Female | 35.38 | 1.23 | 107 |
| | | Unsexed | 0.03 | 1.20 | 146 |
| | | Combined | | 1.35 | 131 |
| Red | 99.29 | Male | 60.91 | 1.04 | 110 |
| | | Female | 37.08 | 0.57 | 90 |
| | | Unsexed | 2.01 | 0.70 | 61 |
| | | Combined | | 0.86 | 101 |
| Golden | 0.09 | Male | 76.26 | 1.43 | 162 |
| | | Female | 23.74 | 0.86 | 111 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 1.29 | 150 |
| Couesi | <0.01 | Male | 66.70 | 1.50 | 140 |
| | | Female | 33.30 | 0.63 | 120 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 1.21 | 133 |

Table B19.--The common and scientific names of rockfish identified in the 1985 foreign and joint venture catches in the Bering Sea/Aleutian Islands region.

| Common name ^{1/} | Scientific name |
|------------------------------|-------------------------------|
| Aurora rockfish | <u>Sebastes aurora</u> |
| Darkblotched rockfish | <u>Sebastes crameri</u> |
| Dusky rockfish | <u>Sebastes ciliatus</u> |
| Northern rockfish | <u>Sebastes polyspinis</u> |
| Pacific ocean perch | <u>Sebastes alutus</u> |
| Redstripe rockfish | <u>Sebastes proriger</u> |
| Rougheye rockfish | <u>Sebastes aleutianus</u> |
| Shortraker rockfish | <u>Sebastes borealis</u> |
| Shortspine thornyhead | <u>Sebastolobus alascanus</u> |
| Other rockfish ^{2/} | |
| Black rockfish | <u>Sebastes melanops</u> |
| Blackgill rockfish | <u>Sebastes melanostomus</u> |
| Blue rockfish | <u>Sebastes mystinus</u> |
| Bocaccio | <u>Sebastes paucispinis</u> |
| Harlequin rockfish | <u>Sebastes variegatus</u> |
| Longspine thornyhead | <u>Sebastelobus altivelis</u> |
| Redbanded rockfish | <u>Sebastes babcocki</u> |
| Sharpchin rockfish | <u>Sebastes zacentrus</u> |
| Shortbelly rockfish | <u>Sebastes jordani</u> |
| Silvergray rockfish | <u>Sebastes brevispinis</u> |
| Splitnose rockfish | <u>Sebastes diploproa</u> |
| Yellowmouth rockfish | <u>Sebastes reedi</u> |

1/ With all rockfish, the possibility of misidentification exists, and the listing of species not previously reported from the Bering Sea/Aleutian Islands region should be noted with caution.

2/ The 12 species listed under "Other rockfish" each made up less than .10% of the rockfish catch by foreign vessels.

Table B20.--Estimated catch of rockfish by species and area in the Bering Sea/Aleutian Islands region during 1985.

| Common name | AREA I | | AREA II | | AREA IV | | TOTAL | |
|--------------------------------------|--------|-------|---------|--------|---------|-------|--------|-------|
| | t | % | t | % | t | % | t | % |
| -----Foreign directed fisheries----- | | | | | | | | |
| Aurora rockfish | 0.52 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.52 | 0.44 |
| Darkblotched rockfish | 0.06 | 0.12 | 0.60 | 0.93 | 0.89 | 24.25 | 1.55 | 1.31 |
| Dusky rockfish | 1.35 | 2.72 | 5.19 | 8.04 | 0.30 | 8.17 | 6.84 | 5.80 |
| Northern rockfish | 4.15 | 8.35 | 1.10 | 1.70 | 0.11 | 3.00 | 5.36 | 4.55 |
| Pacific ocean perch | 16.34 | 32.89 | 19.14 | 29.66 | 0.14 | 3.81 | 35.62 | 30.22 |
| Redstripe rockfish | 0.08 | 0.16 | 0.18 | 0.28 | 0.02 | 0.54 | 0.28 | 0.24 |
| Rougheye rockfish | 3.83 | 7.71 | 11.84 | 18.35 | 0.35 | 9.54 | 16.02 | 13.59 |
| Shortraker rockfish | 8.79 | 17.69 | 12.14 | 18.81 | 0.98 | 26.70 | 21.91 | 18.59 |
| Shortspine thornyhead | 14.56 | 29.31 | 14.09 | 21.83 | 0.88 | 23.98 | 29.53 | 25.05 |
| Other rockfish* | <0.01 | <0.01 | 0.25 | 0.39 | <0.01 | <0.01 | 0.25 | 0.21 |
| Total | 49.68 | | 64.53 | | 3.67 | | 117.88 | |
| Percent by area | 42.14 | | 54.74 | | 3.11 | | | |
| -----Joint venture fisheries----- | | | | | | | | |
| Aurora rockfish | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Darkblotched rockfish | <0.01 | <0.01 | 0.00 | 0.00 | 0.00 | 0.00 | <0.01 | <0.01 |
| Dusky rockfish | 0.49 | 1.40 | <0.01 | <0.01 | 8.16 | 1.91 | 8.65 | 1.87 |
| Northern rockfish | 1.90 | 5.43 | 0.01 | 100.00 | 196.16 | 45.81 | 198.07 | 42.76 |
| Pacific ocean perch | 31.59 | 90.31 | <0.01 | <0.01 | 214.91 | 50.18 | 246.50 | 53.21 |
| Redstripe rockfish | 0.09 | 0.26 | 0.00 | 0.00 | 0.07 | 0.02 | 0.16 | 0.03 |
| Rougheye rockfish | 0.02 | 0.06 | 0.00 | 0.00 | 8.59 | 2.01 | 8.61 | 1.86 |
| Shortraker rockfish | 0.26 | 0.74 | 0.00 | 0.00 | 0.12 | 0.03 | 0.38 | 0.08 |
| Shortspine thornyhead | 0.30 | 0.86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | 0.06 |
| Other rockfish* | 0.33 | 0.94 | 0.00 | 0.00 | 0.23 | 0.05 | 0.56 | 0.12 |
| Total | 34.98 | | 0.01 | | 428.24 | | 463.23 | |
| Percent by area | 7.55 | | <0.01 | | 92.45 | | | |

*Species included in this category are listed in Table B19.

Table B21 .--The common and scientific names of flatfish identified in the 1985 foreign and joint venture catches in the Bering Sea/Aleutian Islands region.

| Common name | Scientific name |
|------------------------------|--|
| Alaska plaice | <u>Pleuronectes quadrituberculatus</u> |
| Arctic flounder | <u>Liopsetta glacialis</u> |
| Arrowtooth flounder (turbot) | <u>Atheresthes stomias</u> |
| Bering flounder | <u>Hippoglossoides robustus</u> |
| Butter sole | <u>Isopsetta isolepis</u> |
| Curlfin sole | <u>Pleuronichthys decurrens</u> |
| Deepsea sole | <u>Ernbassichthys bathybius</u> |
| Dover sole | <u>Microstomus pacificus</u> |
| English sole | <u>Parophrys vetulus</u> |
| Flathead sole | <u>Hippoglossoides elassodon</u> |
| Greenland turbot | <u>Reinhardtius hippoglossoides</u> |
| Hybrid sole | <u>Inopsetta ischyra</u> |
| Kamchatka flounder | <u>Atheresthes evermanni</u> |
| Longhead dab | <u>Limanda proboscidea</u> |
| Pacific sanddab | <u>Citharichthys sordidus</u> |
| Petrale sole | <u>Eopsetta jordani</u> |
| Rex sole | <u>Glyptocephalus zachirus</u> |
| Rock sole | <u>Lepidopsetta bilineata</u> |
| Roughscale sole | <u>Clidoderma asperrimum</u> |
| Sand sole | <u>Psettichthys melanostictus</u> |
| Slender sole | <u>Lyopsetta exilis</u> |
| Starry flounder | <u>Platichthys stellatus</u> |
| Yellowfin sole | <u>Limanda aspera</u> |

Table B22.--Estimated catch of flatfish by species and area in the Bering Sea/Aleutian Islands region during 1985.

| Common name | AREA I | | AREA II | | AREA IV | | TOTAL | |
|--------------------------------------|------------|-------|-----------|-------|---------|-------|------------|-------|
| | t | % | t | % | t | % | t | % |
| -----Foreign directed fisheries----- | | | | | | | | |
| Alaska plaice | 10,539.12 | 8.26 | 260.99 | 1.30 | 0.00 | 0.00 | 10,800.11 | 7.31 |
| Arctic flounder | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Arrowtooth flounder | 1,278.89 | 1.00 | 5,286.78 | 26.43 | 10.40 | 21.46 | 6,576.07 | 4.45 |
| Bering flounder | 2.46 | <0.01 | 3.26 | 0.02 | 0.00 | 0.00 | 5.72 | <0.01 |
| Butter sole | 5.73 | <0.01 | 1.45 | 0.01 | 0.00 | 0.00 | 7.18 | <0.01 |
| Curlfin sole | 0.43 | <0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.43 | <0.01 |
| Deepsea sole | 0.66 | <0.01 | 0.15 | <0.01 | 0.00 | 0.00 | 0.81 | <0.01 |
| Dover sole | 1.96 | <0.01 | 1.10 | 0.01 | 0.00 | 0.00 | 3.06 | <0.01 |
| English sole | 0.17 | <0.01 | <0.01 | <0.01 | 0.00 | 0.00 | 0.17 | <0.01 |
| Flathead sole | 2,790.85 | 2.19 | 1,120.47 | 5.60 | 5.64 | 11.64 | 3,916.96 | 2.65 |
| Greenland turbot | 3,282.68 | 2.57 | 11,406.15 | 57.03 | 31.07 | 64.10 | 14,719.90 | 9.97 |
| Hybrid sole | 0.24 | <0.01 | 0.51 | <0.01 | 0.00 | 0.00 | 0.75 | <0.01 |
| Kamchatka flounder | 20.14 | 0.02 | 254.35 | 1.27 | 0.77 | 1.59 | 275.26 | 0.19 |
| Longhead dab | 31.17 | 0.02 | 0.08 | <0.01 | 0.00 | 0.00 | 31.25 | 0.02 |
| Pacific sanddab | 0.06 | <0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | <0.01 |
| Petrale sole | 12.39 | 0.01 | 1.55 | 0.01 | 0.00 | 0.00 | 13.94 | 0.01 |
| Rex sole | 74.63 | 0.06 | 38.86 | 0.19 | 0.00 | 0.00 | 113.49 | 0.08 |
| Rock sole | 10,020.78 | 7.85 | 134.31 | 0.67 | 0.59 | 1.22 | 10,155.68 | 6.88 |
| Roughscale sole | 0.18 | <0.01 | 0.17 | <0.01 | 0.00 | 0.00 | 0.35 | <0.01 |
| Sand sole | 0.00 | 0.00 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Slender sole | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Starry flounder | 313.44 | 0.25 | 5.25 | 0.03 | 0.00 | 0.00 | 318.69 | 0.22 |
| Yellowfin sole | 99,221.97 | 77.76 | 1,484.52 | 7.42 | 0.00 | 0.00 | 100,706.49 | 68.21 |
| Total | 127,597.95 | | 19,999.95 | | 48.47 | | 147,646.37 | |
| Percent by area | 86.42 | | 13.55 | | 0.03 | | | |
| -----Joint venture fisheries----- | | | | | | | | |
| Alaska plaice | 14,086.97 | 8.17 | 1.40 | 7.66 | 0.00 | 0.00 | 14,088.37 | 8.16 |
| Arctic flounder | 6.47 | <0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 6.47 | <0.01 |
| Arrowtooth flounder | 427.20 | 0.25 | 2.87 | 15.71 | 59.31 | 18.27 | 489.38 | 0.28 |
| Bering flounder | 3.78 | <0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 3.78 | <0.01 |
| Butter sole | 56.70 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 56.70 | 0.03 |
| Curlfin sole | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Deepsea sole | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dover sole | 5.45 | <0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 5.45 | <0.01 |
| English sole | 6.87 | <0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 6.87 | <0.01 |
| Flathead sole | 1,713.49 | 0.99 | 4.14 | 22.66 | 1.06 | 0.33 | 1,718.69 | 0.99 |
| Greenland turbot | 8.60 | <0.01 | 0.37 | 2.03 | 1.92 | 0.59 | 10.89 | 0.01 |
| Hybrid sole | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Kamchatka flounder | 18.36 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 18.36 | 0.01 |
| Longhead dab | 89.51 | 0.05 | 0.00 | 0.00 | 0.62 | 0.19 | 90.13 | 0.05 |
| Pacific sanddab | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Petrale sole | 38.02 | 0.02 | 0.00 | 0.00 | 0.07 | 0.02 | 38.09 | 0.02 |
| Rex sole | 56.23 | 0.03 | 0.45 | 2.46 | 0.16 | 0.05 | 56.84 | 0.03 |
| Rock sole | 27,259.38 | 15.81 | 8.02 | 43.90 | 255.36 | 78.67 | 27,522.76 | 15.93 |
| Roughscale sole | 0.47 | <0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.47 | <0.01 |
| Sand sole | 0.11 | <0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | <0.01 |
| Slender sole | 0.33 | <0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | <0.01 |
| Starry flounder | 2,225.02 | 1.29 | 0.00 | 0.00 | 0.04 | 0.01 | 2,225.06 | 1.29 |
| Yellowfin sole | 126,400.08 | 73.32 | 1.02 | 5.58 | 6.06 | 1.87 | 126,407.16 | 73.18 |
| Total | 172,403.04 | | 18.27 | | 324.60 | | 172,745.91 | |
| Percent by area | 99.80 | | 0.01 | | 0.19 | | | |

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C. SUMMARY OF OBSERVER SAMPLING FOR THE GULF OF ALASKA REGION

OBSERVER COVERAGE OF FISHING FLEETS

During 1985, foreign vessels from Japan and the Republic of Korea spent 685 vessel days fishing on foreign quotas in the U.S. 200-mile EEZ in the Gulf of Alaska region (Table C1) (Fig. C1). This level of effort is 74% lower than that used in 1984 (Berger et al., 1985), continuing the trend of decreased foreign fishing in the Gulf of Alaska. United States fisheries observers spent 639 days sampling aboard these foreign vessels, resulting in an observer coverage (100 x number of observer days/number of foreign vessel days) of 93.3%. This is a 7.7% increase over the 1984 level of coverage (Berger et al., 1985).

The effort of foreign vessels participating in joint ventures with U.S. catcher boats in 1985 was slightly lower (down 3.5%) than in 1984. Foreign vessels spent 2,339 days in joint venture fishing operations. Joint ventures were conducted between U.S. vessels and processing vessels from Japan, the Republic of Korea, Poland, Taiwan, and the U.S.S.R. Observers spent 2,122 days sampling aboard these foreign processing vessels, providing an observer coverage of 90.7%.

A total of 2,761 of the 3,024 vessel days (foreign and joint venture fisheries combined) were sampled by observers in 1985, making an overall percent coverage of 91.3%. In 1984, the overall percent coverage by observers was 86.9%.

ESTIMATES OF FOREIGN AND U.S. JOINT VENTURE CATCHES

The total estimated catch by foreign vessels in the Gulf of Alaska in 1985 was approximately 41,000 t (Table C2). Of the 1985 foreign catches, 78.5% was taken by Japan and 21.5% was taken by the Republic of Korea. The Pacific ocean perch complex, other rockfish complex, and sablefish were declared prohibited species for the foreign and joint venture fisheries in 1985 since essentially all of the allowable catch was set aside for the U.S. domestic fishery (excluding joint venture fisheries). Prohibited species catch (PSC) limits were established for each of these three management groups for the foreign fishery and though the catches of these species could not be retained, catches in excess of the PSC limits could close the target fishery. Foreign vessels were only allowed to target on walleye pollock and Pacific cod in 1985. The catches of these two species accounted for over 99% of the foreign catch in 1985. Pollock accounted for 77.0% of the catch while Pacific cod accounted for 22.2% of the catch.

In 1985, a total of over 247,200 t of groundfish were landed in the U.S. joint venture fisheries (Table C2). Walleye pollock constituted over 96% of the joint venture catch. The catches of flatfish, Pacific cod, other fish, and Atka mackerel composed most of the remaining portions of the catch. The majority of the pollock caught in joint venture fisheries were taken in the

fisheries conducted in the Shelikof Strait from January to April (219,600 t), whereas the catches of the other species were taken in various fisheries conducted in the Kodiak, Chirikof, and Shumagin areas throughout the year.

Table C3 presents a summary of the foreign and joint venture catches by species for the years 1977 to 1985. The 1985 total foreign catch of about 41,000 t represents a decrease of about 67% from the estimated catch of 123,700 t in 1984. The 1985 U.S. joint venture groundfish catch was about 13% greater than the 1984 catch of that fishery and is 13.5 times greater than the 1981 joint venture catch and 161 times greater than the 1979 joint venture catch (Table C3). This reflects the rapid growth of joint ventures in recent years. The 1985 total estimated removal of fish from the Gulf of Alaska in foreign and joint venture fisheries amounted to 288,205 t, a 16.1% decrease from the estimated removal in 1984 of 343,330 t.

INCIDENCE AND INCIDENTAL CATCH OF PROHIBITED SPECIES

Pacific Salmon

Incidental catches of salmon occurred in groundfish catches made by foreign and joint venture vessels in the Shumagin, Chirikof, and Kodiak areas in 1985. The incidence and average weights of salmon taken in catches sampled by observers are listed in Table C4. With the exception of the U.S.-Poland joint venture fishery in the Kodiak area, the average annual incidence of salmon was less than 0.100 fish/t in the various foreign and joint venture fisheries. The U.S.-Poland joint venture fishery averaged 1.589 salmon/t in the Kodiak area. This high annual average incidence of salmon was the result of high catches of salmon taken in October (0.363 salmon/t), November (2.331 salmon/t), and December (1.932 salmon/t).

On the small stern trawlers and large freezer trawlers, low numbers of salmon occurred throughout the Gulf of Alaska. The incidence of salmon by $1/2^\circ$ latitude by 1° longitude statistical block is illustrated for large surimi trawlers (Fig. C2) and joint venture vessels (Fig. C3). Only one occurrence of over three salmon/t was observed on large surimi trawlers. This occurred in the fourth quarter ($55^\circ 00'$ N lat., 158° W long.). In the joint venture fishery, incidence rates of salmon were very low. No rates of over 3 salmon/t occurred, and only in the fourth quarter did any rates greater than 1 salmon/t occur (south of Kodiak Island, $56^\circ 00'$ - $57^\circ 00'$ N lat., 152° W long.). These incidental catches occurred while targeting on pollock with midwater or pelagic trawl gear.

The estimated incidental catches of salmon, by area and vessel class, are shown in Table C5. The foreign groundfish fishery was estimated to have taken a total of 365 salmon (1.64 t) in 1985. Japanese vessels caught 86.8% of the salmon (317 fish), and Republic of Korea ships caught 13.2% (48 salmon). Most of the salmon were caught in the Shumagin (66.85%) and Kodiak (28.77%) areas. The estimated catch in 1985 was about 97% lower than that of 1984, and was the lowest foreign incidental catch of salmon since the MFCMA was implemented in 1977 (Table C6).

The 1985 joint venture fishery was estimated to have taken more than 13,700 salmon. Over 58.7% of the salmon were taken in the Kodiak area, 39.5% of the salmon were taken in the Chirikof area, and 1.8% were taken in the Shumagin area. The incidental catch in 1985 was 78.5% lower than that taken in 1984 (Table C6). As in 1984, most of the incidental salmon catch in 1985 (60%) occurred in a pollock fishery conducted during the fourth quarter of the year. The catch of salmon in this late fall fishery was reduced from that of 1984 through reduction in the incidence of salmon in catches and a reduction in the total size of the fishery. The total incidental catch (foreign and joint venture combined) of 14,102 salmon was the fourth smallest catch since the implementation of the MFCMA in 1977.

The species composition and average length of the salmon species are given in Table C7. Females predominated the catches of all species of salmon in both the foreign and joint venture fisheries.

Three salmon species were caught incidentally in the foreign fishery. Chinook salmon predominated, making up 95.7% of the salmon catch, Chum salmon made up 2.5% of the catch and coho salmon composed about 1.8% of the catch. Chinook salmon had an average weight of 4.5 kg and an average length of 63.8 cm.

In the joint venture fishery, four species of salmon were identified. Chinook salmon accounted for 99.3% of the salmon caught. Chum salmon made up 0.5% of the catch, coho salmon composed about 0.2%, and sockeye salmon accounted for 0.03%. Chinook salmon had an average weight of 3.1 kg and an average length of 58.2 cm.

Pacific Halibut

Table C8 lists the incidence of halibut in foreign and joint venture catches by nation and vessel class and, in the longline fishery, by depth of fishing. The annual mean incidence of halibut by area in catches by Japanese and Republic of Korea trawlers was very low, ranging from about 0 to 0.6 halibut/t. Japanese longline vessels only fished in waters shallower than 500 m (usually between 100 and 300 m) in 1985, targeting on Pacific cod. The mean annual incidence of halibut for the longline fishery was 11.9 halibut/t in the Shumagin area and 16.2 halibut/t in the Chirikof area.

Halibut incidence varied widely among the different joint venture operations by area and month. The incidence of halibut in the pollock joint venture fisheries conducted in the Shelikof Strait (January through April in the Kodiak and Chirikof area) were low (<0.05 halibut/t). In contrast, the incidence of halibut in joint venture fisheries other than the Shelikof Strait pollock fishery generally averaged from 1 to 9 halibut/t with monthly rates as high as 11 to 16 halibut/t observed. The non-Shelikof Strait fisheries operations usually targeted on a number of different species including pollock, Pacific cod, flatfish, and Atka mackerel.

The incidence of halibut by $1/2^\circ$ latitude by 1° longitude block is illustrated by quarter of the year for longline vessels and for the joint venture fisheries (Figs. C4, C5). The incidence of halibut in the foreign

longline fishery (Fig. C4) exceeded 10 halibut/t in most areas fished during the first and second quarters. There was no fishing conducted by longline vessels during the second half of the year. In the joint venture fisheries (Fig. C5), incidence rates between 1 and 10 halibut/t predominated in the second, third, and fourth quarters. In the first quarter, incidence rates were all below 1 halibut/t. In the second quarter, several instances of incidence rates greater than 10 halibut/t occurred just south of the Alaska Peninsula between 157° and 163° W longitude.

The estimated incidental catches of Pacific halibut, by area and vessel class, are shown in Table C9. The foreign groundfish fishery took approximately 124,800 halibut (241 t) in 1985. All of the halibut were landed in the Shumagin and Chirikof areas (76.4% and 23.6%, respectively). Japanese longline vessels accounted for 94.8% of the halibut taken by foreign vessels (90.0% by weight). In 1985, the joint venture incidental catch of halibut was 78,484 fish, most of which were caught in the Kodiak area (57.6%) by bottom trawl fisheries. Table C10 presents a summary of the foreign and joint venture incidental catches of Pacific halibut for the years 1977 to 1985. The 1985 total foreign catch of about 124,800 halibut (241 t) is a decrease in numbers of fish of about 66% over the 1984 catch of 361,900 (1,506 t), and an 84% decrease in weight. Most of the decrease in numbers was due to the reduced amount of fishing by Japanese longline vessels in the Gulf of Alaska (fishing effort was down 71% from 1984). In recent years, increased joint venture operations fishing with bottom trawls on flatfish, Pacific cod, and rockfish have resulted in high incidence rates and increased the catch of halibut to 98,571 fish in 1983, and 165,721 fish in 1984. A decrease in the groundfish catch by these fisheries in 1985 resulted in a 53% decrease in the incidental halibut catch to 78,484 fish in 1985. The total halibut catch by the foreign and joint venture fisheries of 203,270 fish is the lowest catch since the MFCMA was implemented in 1977.

In 1985, trawl-caught halibut averaged 3.7 kg in the Shumagin area and 3.5 kg in the Chirikof area. Halibut hooked in the longline fishery were of lower average weight (2.3 kg in the Shumagin area and 2.9 kg in the Chirikof area). Halibut caught in the joint venture fisheries averaged 3.8 kg in the Shumagin area, 3.9 kg in the Chirikof area, and 4.4 kg in the Kodiak area. Average lengths of halibut by area (foreign and joint venture combined) were as follows: Shumagin, 60.7 cm; Chirikof, 65.6 cm; and Kodiak, 71.3 cm. Halibut taken in the longline fishery were generally smaller (average length 60.0 cm) than those caught by small stern trawlers, large surimi trawlers, or large freezer trawlers (average lengths 64.4, 62.1, and 64.4 cm, respectively). The halibut measured from joint venture catches averaged 69.7 cm in length.

Tanner Crab

Table C11 presents the incidence of Tanner crab in foreign and joint venture catches by nation, vessel class, and (in the longline fishery) depth of fishing. The incidence of Tanner crab in the foreign trawl and longline fisheries was very low in 1985, less than 0.05 crab/t. The incidence of Tanner crab in the joint venture fishery varied by operation and area. The incidence of Tanner crab was high in catches made in the U.S.-Taiwan joint venture fishery in the Shumagin (31.784 crab/t), Chirikof (1.453 crab/t), and Kodiak

(15.988 crab/t) areas. Incidence rates of Tanner crab exceeding 1.0 crab/t were also observed in the Kodiak area in the U.S.-Japan and U.S.-Poland joint ventures. In the remaining joint venture operations, the average annual incidence of Tanner crab was less than 0.3 crab/t.

The incidence of Tanner crab in joint venture catches is shown by 1/2° latitude and 1° longitude block by quarter in Figure C6. An incidence of 25 crab/t or greater was observed in several areas around Kodiak Island during the second and third quarters of 1985. In all other areas the incidence rates of Tanner crab were below 10 crab/t, except for the second quarter at 54°00' N latitude, 162° W longitude.

The total estimated catch of Tanner crab was approximately 509 crab or about 0.3 t (Table C12) in the foreign groundfish fishery. Longliners hooked 261 Tanner crab, and the remaining 248 crab were taken in the various trawl fisheries. The joint venture fishery caught over 64,600 Tanner crab, 93.0% of them in the Kodiak area. The 1985 incidental catch of Tanner crab (from foreign and joint venture fisheries combined) is up 29% from that of 1984 (Table C13), even though the total foreign catch of 509 Tanner crab represents a 94.3% decrease from the 1984 catch of 8,900 crab and is the lowest catch recorded for the years 1978-85. This decrease is due to the decreased fishing effort by foreign fishing vessels in the Gulf of Alaska. The increased incidental catch (55% over that of 1984) taken in the joint venture fishery more than compensated for the decreased foreign catch. The increased catch in the joint venture fishery was due to increased incidence of Tanner crab in the fisheries utilizing bottom trawls.

The species composition and average size of the Tanner crab are given in Table C14. Only two species of Tanner crab were identified in the 1985 foreign fishery: Chionoecetes bairdi and C. opilio. For the years 1981-84, C. bairdi and C. tanneri had accounted for-almost all of the catch of Tanner crab. In 1984 essentially all of the C. tanneri were caught in longline operations. In 1985, sablefish were a prohibited species and this resulted in shallow-water longline operations targeting on Pacific cod. Chionoecetes tanneri are typically caught in deep water, and so were avoided in 1985. In 1985, C. bairdi and C. opilio formed 67.4% and 32.6% by number, respectively. In the-joint venture fishery, four species of Tanner crab were identified. Chionoecetes bairdi made up 99.52% of the total crab catch, with C. angulatus (0.36%), C. opilio (0.09%), and C. tanneri (0.02%) accounting for-the remainder.

King Crab

Table C15 gives the incidence of king crab in the 1985 foreign groundfish and joint venture fisheries by vessel class and area. The mean annual incidence rates in the foreign fishery were low, ranging from 0 to 0.002 crab/t. The only catch of king crab (incidence rate of 0.003 crab/t) occurred for Japanese longline vessels fishing at depths of less than 500 m in the Shumagin area in March. In the joint venture fishery, the mean annual incidence rates ranged from 0 to 0.906 crab/t. The highest monthly incidence rates in the joint venture fishery were in the U.S.-Taiwan operation in the Chirikof area in August (2.5 crab/t), July (0.8 crab/t), and September (0.7 crab/t); and in the U.S.-Poland operation in the Chirikof area in November (0.8 crab/t).

The estimated incidental catches of king crab, by area and vessel class, are shown in Table C16. Ten king crab (0.01 t) were taken in the 1985 foreign groundfish fishery, all by Japanese longline vessels fishing in the Shumagin area. The joint venture fishery landed an estimated 2,400 king crab in 1985 compared to 5,500 caught in 1984. Most of the king crab were taken in the Chirikof (55.9%) and Kodiak (43.7%) areas. Table C17 presents a summary of the foreign and joint venture incidental catches of king crab for the years 1978 to 1985. The combined foreign and joint venture incidental king crab catch of 2,437 crab is the lowest catch by numbers and second lowest in terms of weight of king crab since the implementation of the MFCMA in 1977.

The species composition and average size of the king crab are given in Table C18. Three species of king crab were identified in the 1985 groundfish catches: red king crab, blue king crab, and golden king crab. In the foreign fishery, only 10 blue king crab were caught. In the joint venture fishery, 99.6% of the king crab taken were red king crab. Golden king crab accounted for 0.3% and blue king crab composed 0.1%.

In 1985, the reduced foreign fishing effort and the restrictions on target species led to a reduction in the number of king crab caught. The blue king crab were caught by longline vessels in the Shumagin area.

ROCKFISH CATCH BY SPECIES

Table C19 lists the common and scientific names of the 22 species of rockfish that were identified by observers as appearing in foreign or joint venture catches in the Gulf of Alaska during 1985. In this table, and in Table C20, the group "other rockfish" consists of 7 species which make up a relatively minor percentage of the rockfish catch.

The rockfish catch data by nation and vessel class were combined for each area and are presented in Table C20. As previously mentioned, the catches of rockfish by foreign and joint venture fisheries were limited by the establishment of these species as "prohibited species" for these fisheries in 1985 and the setting of prohibited species catch limits for each of these species. These regulatory changes resulted in large decreases in the catches of rockfish in 1985. Approximately 13.4 t of rockfish were estimated to have been taken by foreign fishing vessels in the Gulf of Alaska in 1985, down about 99.6% from the 3,200 t in 1984 (Berger et al., 1985). The catch of Pacific ocean perch (almost 5.8 t) and shortspine thornyhead rockfish (almost 3.8 t) represented 42.95% and 28.3%, respectively, of the total rockfish catch by foreign nations. The largest percentage of rockfish (82.8%) was landed in the Shumagin area. The Kodiak and Chirikof areas accounted for 14.8% and 2.4% of the rockfish catch, respectively. In 1985, joint venture operations landed 308 t of rockfish (down 84.6% from 1984). Almost 77.8% of the catch occurred in the Shumagin area, 11.8% in the Chirikof area, and 10.5% in the Kodiak area. Pacific ocean perch (36.5%) and northern rockfish (35.1%) accounted for most of the catch.

FLATFISH CATCH BY SPECIES

Table C21 lists the common and scientific names of the 19 species of flatfish that were identified by observers as appearing in foreign or joint venture catches in the Gulf of Alaska in 1985.

Arrowtooth flounder was the predominant flatfish in foreign groundfish catches in all areas, making up almost 78.6% of the total estimated foreign flatfish catch of about 170 t (Table C22). Rock sole, flathead sole, and rex sole made up 9.75%, 5.1%, and 4.5% of the catch, respectively. The largest percentage of flatfish (67.7%) was landed in the Shumagin area. The Chirikof area accounted for 32.0% and the Kodiak area yielded 0.3%. Although some joint venture operations targeted on flatfish and caught over 2,400 t in 1985, this represented a decrease of 29% from 1984. The Kodiak area accounted for 63.5% of the flatfish catch, with the Chirikof and Shumagin areas yielding 23.3% and 13.2% of the catch, respectively. In 1985, arrowtooth flounder made up the largest percentage of the joint venture flatfish catches (75.8%). Flathead sole, rock sole, rex sole, and Dover sole made up 10.5%, 6.1%, 4.0%, and 1.7% of the catch, respectively.

Table C1 .--Percent observer coverage of the foreign and joint venture fisheries in the Gulf of Alaska, 1985.

| Fishery | No. of observers | No. of ships observed | No. of ships in fishery | No. of observer days | No. of vessel days | Percent coverage ^{1/} |
|---|---------------------|-----------------------------|-------------------------------|----------------------------|--------------------------|-----------------------------------|
| Japan | | | | | | |
| Small stern trawlers | 3 | 2 | 2 | 4 | 10 | 40.0 |
| Surimi trawlers | 6 | 3 | 3 | 165 | 177 | 93.2 |
| Longline vessels | 24 | 22 | 22 | 399 | 413 | 96.6 |
| Total | | 27 | 27 | 568 | 600 | 94.7 |
| Republic of (ROK) | | | | | | |
| Small stern trawlers | 1 | 2 | 2 | 7 | 7 | 100.0 |
| Large freezer trawlers | 13 | 14 | 16 | 64 | 78 | 82.1 |
| Total | | 16 | 18 | 71 | 85 | 83.5 |
| Total - Foreign Fishery | | 43 | 45 | 639 | 685 | 93.3% |
| U.S.-Japan joint venture ^{2/} | 17 | 17 | 17 | 592 | 620 | 95.5 |
| U.S.-ROK joint venture ^{2/} | 30 | 20 | 20 | 674 | 730 | 92.3 |
| U.S.-Poland joint venture ^{2/} | 16 | 11 | 12 | 464 | 555 | 83.6 |
| U.S.-Taiwan joint venture ^{2/} | 12 | 4 | 4 | 378 | 418 | 90.4 |
| U.S.-U.S.S.R. joint venture ^{2/} | 3 | 3 | 3 | 14 | 16 | 87.5 |
| Total - Joint Venture Fishery | | 55 | 56 | 2,122 | 2,339 | 90.7 |
| Grand Total | 125 | 98 | 101 | 2,761 | 3,024 | 91.3 |

1/ Percent coverage = 100 x (observer days/vessel days).

2/ In the joint venture fisheries, only the foreign processing vessels are indicated for the number of ships and vessel days--the U.S. catcher boats are not included.

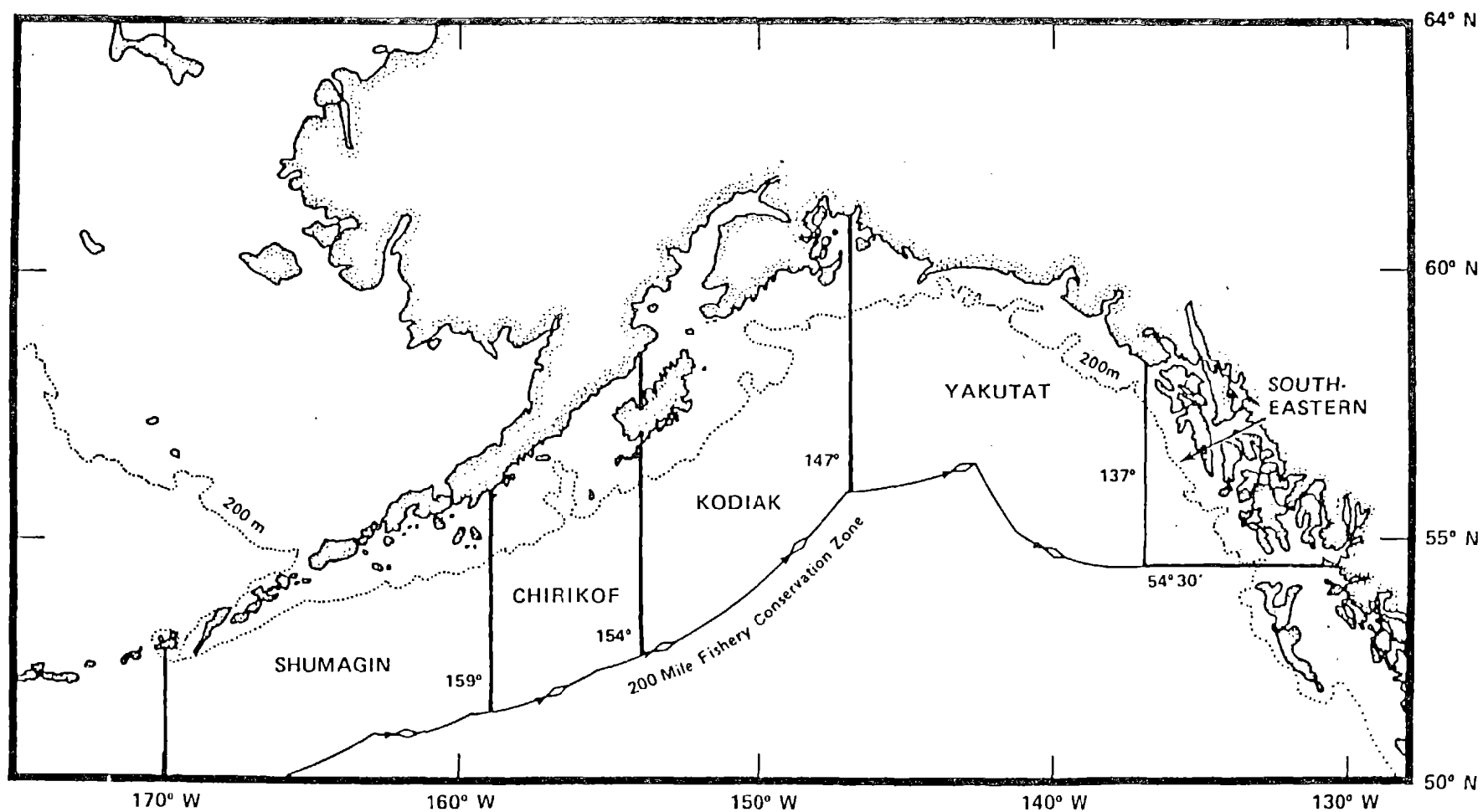


Figure C1.--U.S. statistical areas in the Gulf of Alaska region used to summarize catch and effort data.

Table C2.--Estimated foreign and joint venture catch in the Gulf of Alaska groundfish fishery, 1985.

| Species groups | Foreign catches (metric tons) | | | | U.S. Joint ventures (metric tons) | Per- cent |
|--------------------------------|-------------------------------|----------------------|----------|---------|--------------------------------------|--------------|
| | Japan | Republic of Korea | Total | Percent | | |
| Squid | 4.0 | 2.2 | 6.2 | <0.1 | 6.8 | <0.1 |
| All flounders | 47.2 | 122.8 | 170.0 | 0.4 | 2,447.0 | 1.0 |
| Pollock | 22,937.3 | 8,649.9 | 31,587.2 | 77.0 | 237,859.9 | 96.2 |
| Pacific cod | 9,060.5 | 25.2 | 9,085.7 | 22.2 | 2,265.6 | 0.9 |
| Sablefish | 30.1 | 8.4 | 38.5 | 0.1 | 225.6 | 0.1 |
| Atka mackerel | 0.3 | 1.5 | 1.8 | <0.1 | 1,845.8 | 0.7 |
| Ocean perch spp. ^{1/} | 2.5 | 5.2 | 7.77 | <0.1 | 254.3 | 0.1 |
| Thornyhead rockfish | 3.6 | 0.2 | 3.8 | <0.1 | 8.2 | <0.1 |
| Other rockfish | 1.1 | 0.9 | 2.0 | <0.1 | 45.2 | <0.1 |
| Other fish ^{2/} | 94.6 | 2.3 | 96.9 | 0.2 | 2,246.4 | 0.9 |
| Total | 32,181.2 | 8,818.5 | 40,999.7 | | 247,204.7 | |
| Percent | 78.5 | 21.5 | | | | |

1/ Catches of roughey, shortraker, northern, and sharpchin rockfish were reported combined with Pacific ocean perch in 1985. See Table C21 to obtain the catch by species.

2/ "Other fish" does not include the catch of rattails, Coryphaenoides spp., which foreign vessels were not required to report in 1985, unless they retained them.

Table C3.--Estimated foreign and joint venture catches by species group in the Gulf of Alaska,
1977-85^{1/}.

| | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| -----Foreign directed catches (metric tons)----- | | | | | | | | | |
| Squid | NA | 322 | 425 | 841 | 1,135 | 278 | 267 | 120 | 6 |
| Flounders | 16,038 | 14,314 | 13,474 | 15,497 | 14,443 | 8,986 | 9,531 | 3,033 | 170 |
| Pollock | 117,834 | 96,392 | 103,187 | 112,997 | 130,324 | 92,612 | 81,358 | 99,260 | 31,587 |
| Pacific cod | 1,988 | 11,371 | 13,174 | 34,245 | 34,969 | 26,936 | 29,777 | 15,897 | 9,086 |
| Sablefish | 15,957 | 7,128 | 6,885 | 6,139 | 7,975 | 5,645 | 4,965 | 1,108 | 38 |
| Atka mackerel | 19,455 | 19,588 | 10,948 | 13,163 | 18,727 | 6,760 | 11,470 | 537 | 2 |
| All rockfish ^{2/} | 23,578 | 10,070 | 12,286 | 16,647 | 17,857 | 10,468 | 7,846 | 3,177 | 14 |
| Other fish ^{3/} | 4,642 | 5,989 | 2,971 | 8,515 | 7,112 | 2,049 | 2,255 | 576 | 97 |
| Total | 199,492 | 165,174 | 163,350 | 208,044 | 232,542 | 153,734 | 147,469 | 123,708 | 41,000 |
| -----Joint-venture catches (metric tons)----- | | | | | | | | | |
| Squid | | 0 | <1 | 0 | <1 | 16 | 4 | 5 | 7 |
| Flounders | | 5 | 70 | 209 | 18 | 18 | 2,692 | 3,449 | 2,447 |
| Pollock | | 34 | 566 | 1,136 | 16,857 | 73,917 | 134,131 | 207,104 | 237,860 |
| Pacific cod | | 7 | 713 | 466 | 58 | 193 | 2,426 | 4,649 | 2,266 |
| Sablefish | | 0 | 18 | 20 | <1 | 1 | 275 | 528 | 226 |
| Atka mackerel | | <1 | 1 | 3 | 0 | 0 | 790 | 585 | 1,846 |
| All rockfish ^{2/} | | 1 | 90 | 28 | 1 | 3 | 2,276 | 2,037 | 307 |
| Other fish ^{3/} | | 1 | 34 | 49 | 33 | 301 | 391 | 1,268 | 2,246 |
| Total | 4/ | 48 | 1,492 | 1,911 | 16,967 | 74,449 | 142,985 | 219,625 | 247,205 |

1/ Estimates for years 1977-84 are from Berger et al., 1986.

2/ As rockfish reporting requirements have changed over the years, for comparison purposes, all rockfish are combined into a single group.

3/ Reporting requirements of rattails, *Coryphaenoides* spp., have changed. In 1978, rattails were included in the "other fish" category. In 1980, rattails were reported in a separate category, and in this table, rattails make up 2,960 mt of the 1980 foreign catches of "other fish". (No rattails were estimated to have been taken in the 1980 joint-venture fishery). In the other years, foreign nations were not required to report them unless they were utilized.

4/ Joint-venture activity did not begin until 1978.

Table C4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985*. Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Small Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | NS | NS | -- | -- | 0.000 | 0.000 |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | 0.000 | 0.000 |
| NOV. | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| -----Japanese Surimi Large Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | 0.741 | 0.983 | 0.017 | 4.342 |
| OCT. | 0.011 | 4.527 | 0.078 | 1.681 | 0.011 | 6.321 |
| NOV. | 0.014 | 6.082 | -- | -- | -- | -- |
| DEC. | 0.012 | 2.194 | 0.012 | 3.800 | 0.000 | 0.000 |
| ANNUAL | 0.012 | 4.690 | 0.065 | 1.602 | 0.015 | 4.633 |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Longliners Fishing <500 M----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| MARCH | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| APRIL | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| -----Republic of Korea Small Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | -- | -- | -- | -- |
| OCT. | 0.013 | 7.000 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.012 | 7.000 | -- | -- | -- | -- |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

Table C4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Republic of Korea Large Freezer Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | 0.000 | 0.000 | -- | -- | -- | -- |
| SEPT. | 0.003 | 1.800 | -- | -- | -- | -- |
| OCT. | 0.005 | 3.302 | NS | NS | -- | -- |
| NOV. | 0.000 | 0.000 | NS | NS | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.004 | 2.952 | NS | NS | -- | -- |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Republic of Korea JV Mothership----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | 0.007 | 3.221 | 0.000 | 0.000 |
| MARCH | -- | -- | 0.002 | 3.238 | 0.000 | 0.000 |
| APRIL | 0.075 | 2.992 | <0.001 | 4.400 | -- | -- |
| MAY | 0.000 | 0.000 | -- | -- | -- | -- |
| JUNE | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | NS | NS | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| OCT. | 0.010 | 3.053 | NS | NS | -- | -- |
| NOV. | 0.007 | 4.500 | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.016 | 3.065 | 0.002 | 3.244 | 0.000 | 0.000 |
| -----U.S.-Japan JV Mothership----- | | | | | | |
| JAN. | -- | -- | 0.425 | 1.970 | -- | -- |
| FEB. | -- | -- | 0.043 | 2.575 | 0.022 | 2.454 |
| MARCH | -- | -- | 0.002 | 3.929 | 0.001 | 5.027 |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | 0.020 | 1.400 |
| NOV. | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | -- | -- | 0.029 | 2.571 | 0.013 | 2.492 |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|-------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Poland JV Mothership----- | | | | | | |
| JAN. | -- | -- | 0.083 | 2.862 | -- | -- |
| FEB. | -- | -- | 0.044 | 3.331 | 0.000 | 0.000 |
| MARCH | -- | -- | <0.001 | 4.049 | 0.000 | 0.000 |
| APRIL | -- | -- | 0.002 | 3.727 | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | 0.047 | 3.978 | NS | NS | 0.363 | 2.206 |
| NOV. | 0.035 | 4.234 | 0.235 | 2.550 | 2.331 | 3.005 |
| DEC. | -- | -- | -- | -- | 1.932 | 3.581 |
| ANNUAL | 0.043 | 4.056 | 0.014 | 3.208 | 1.589 | 3.058 |
| -----U.S.-Taiwan JV Mothership----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | 0.000 | 0.000 | 0.023 | 3.212 |
| JUNE | 0.000 | 0.000 | 0.146 | 4.143 | 0.037 | 3.269 |
| JULY | 0.000 | 0.000 | 0.077 | 3.422 | 0.041 | 3.787 |
| AUG. | -- | -- | 0.008 | 3.700 | 0.000 | 0.000 |
| SEPT. | NS | NS | 0.021 | 5.225 | 0.239 | 3.175 |
| OCT. | -- | -- | -- | -- | 0.023 | 3.514 |
| NOV. | -- | -- | -- | -- | 0.015 | 3.513 |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.000 | 0.000 | 0.063 | 3.561 | 0.050 | 3.286 |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

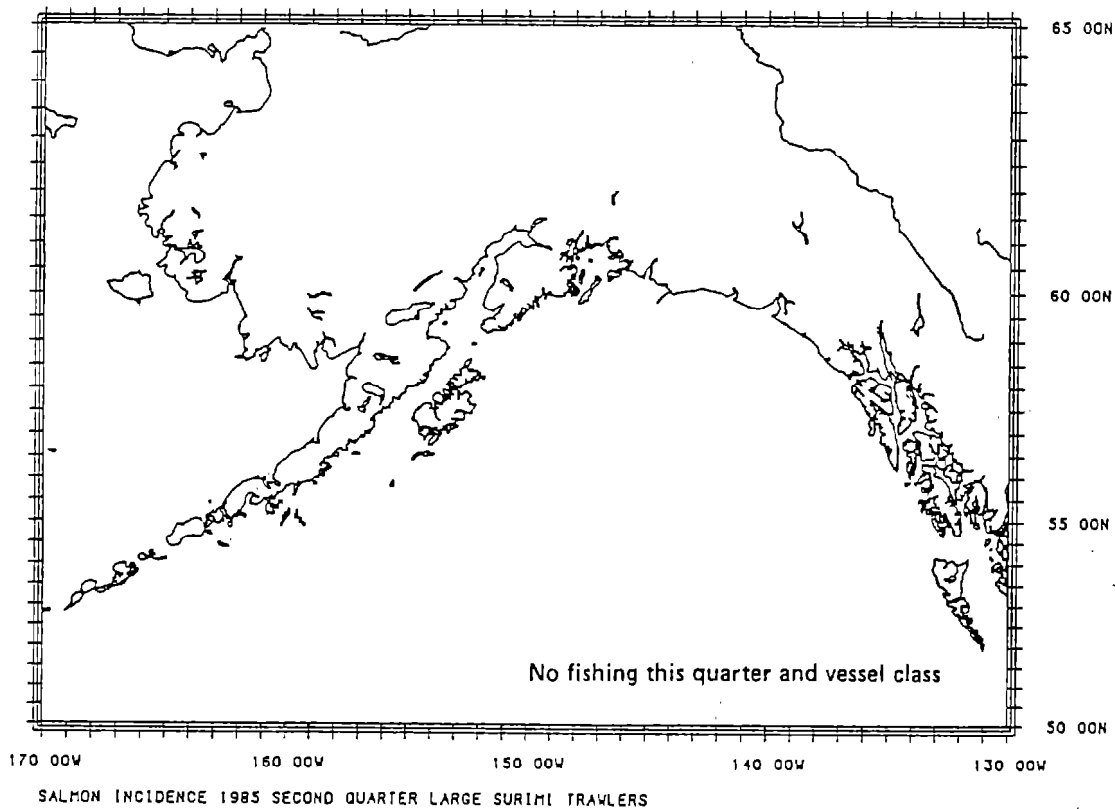
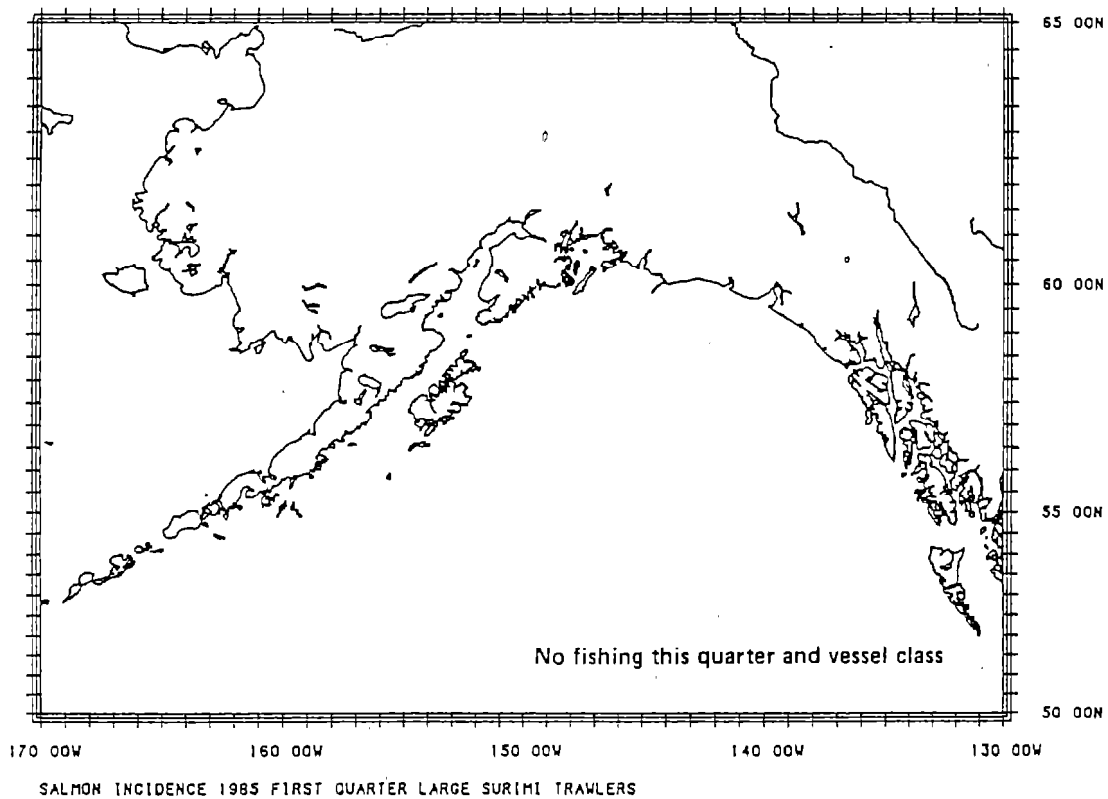


Figure C2.--Average incidence (no./t) of salmon on surimi trawlers (all nations) by quarter and $1/2^\circ$ lat. by 1° long. areas, 1985.

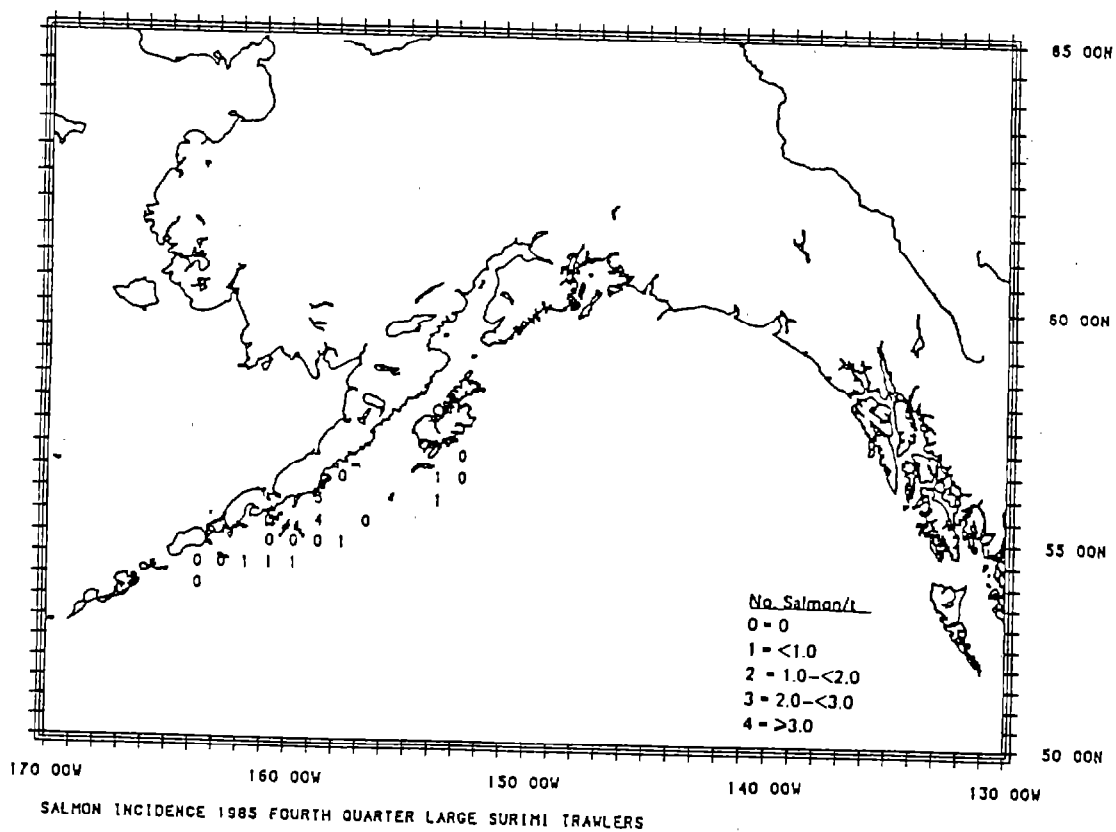
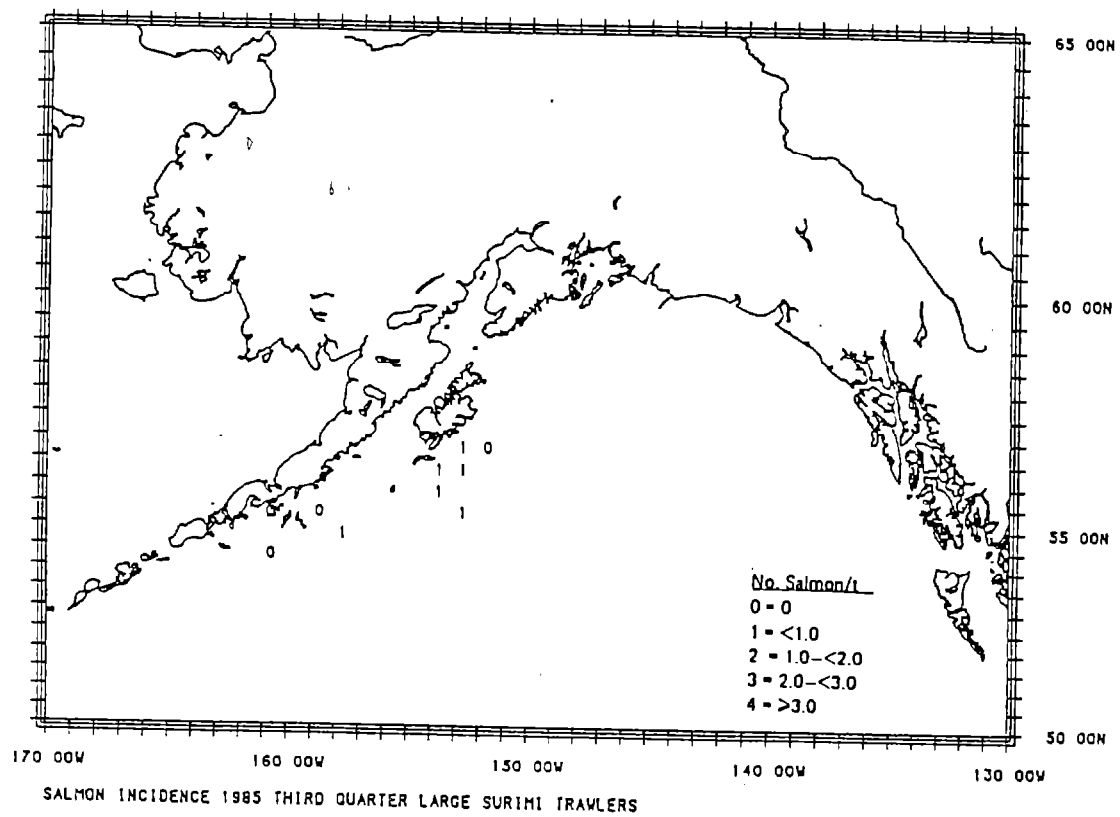


Figure C2.--Continued.

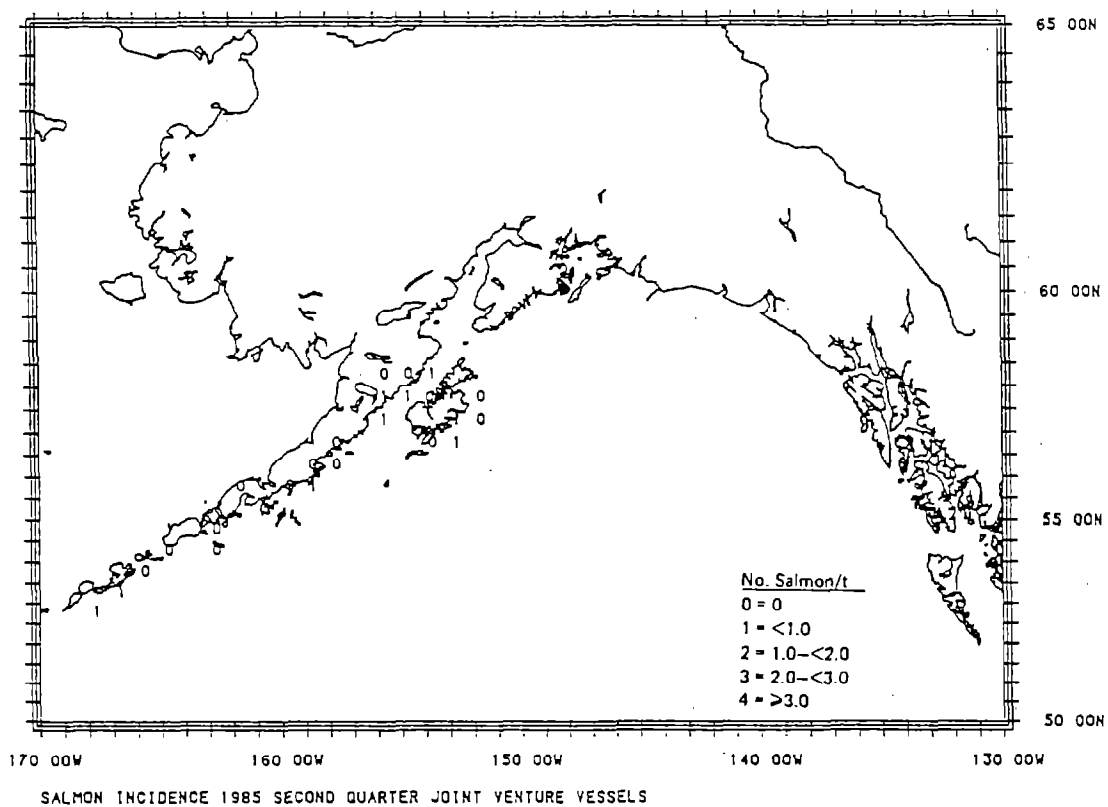
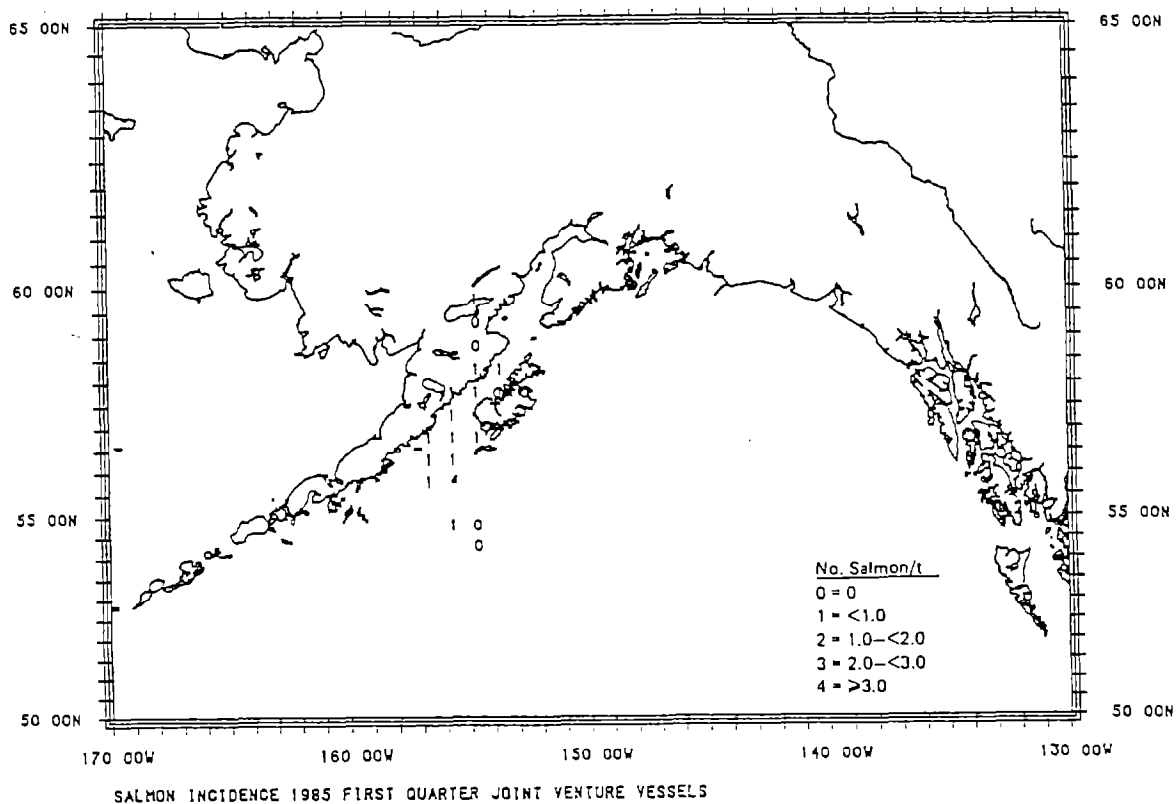


Figure C3. --Average incidence (no./t) of salmon on joint venture vessels (all nations) by quarter and 1/2° lat. by 1° long. areas, 1985.

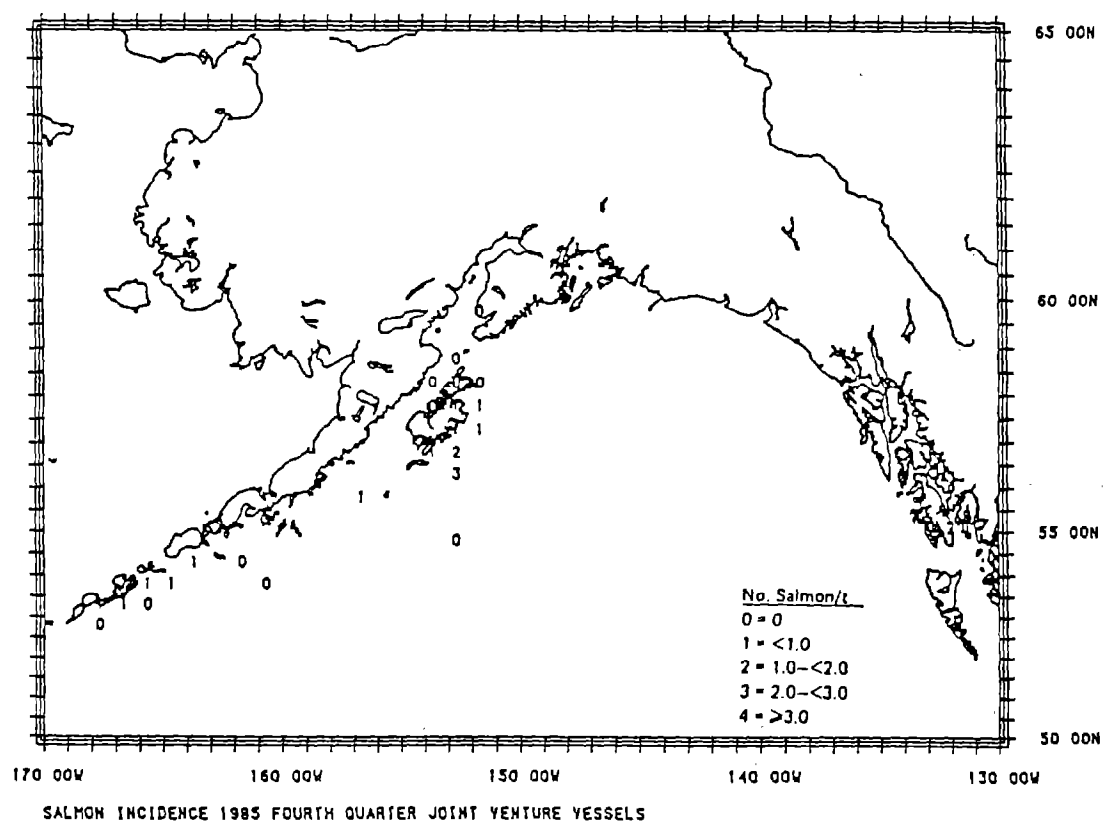
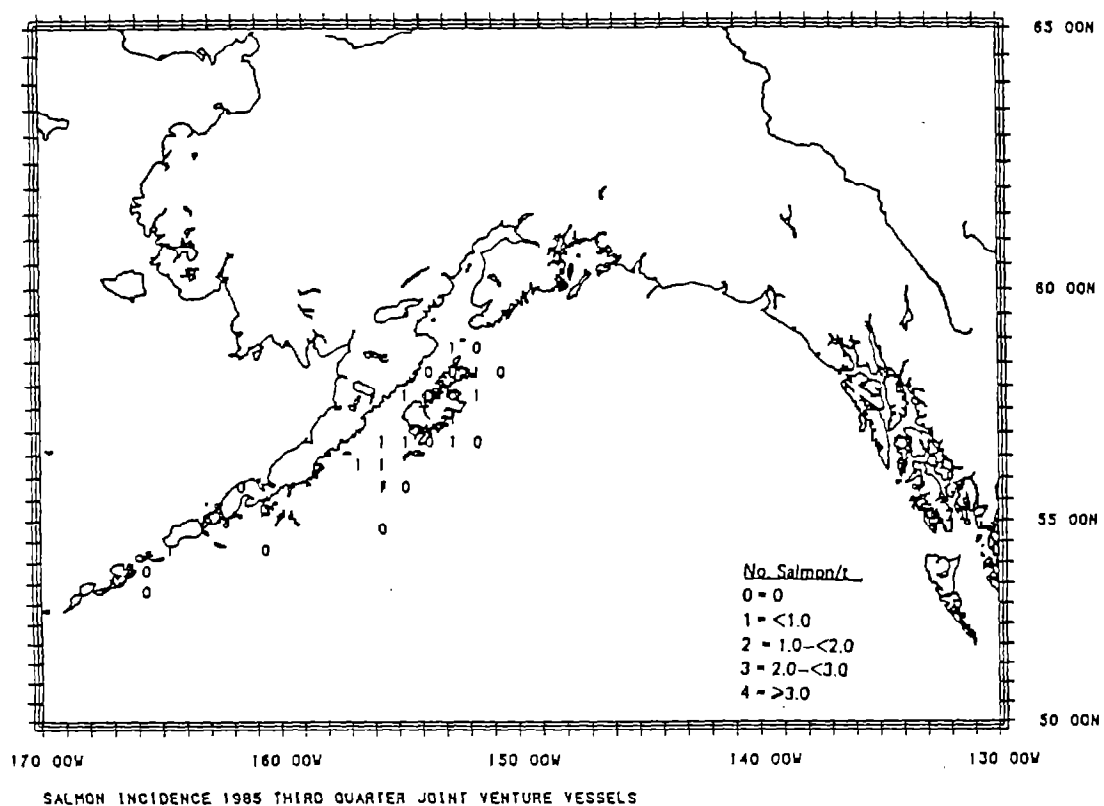


Figure C3.--Continued.

Table C5.--Estimated incidental catches of Pacific salmon (in numbers of fish and metric tons)
by foreign groundfish and joint venture vessels in the Gulf of Alaska, 1985.

| | Number of fish | | | | Weight (metric tons) | | | |
|--------------------------------------|----------------|----------|--------|--------------------|----------------------|----------|--------|--------------------|
| | Shumagin | Chirikof | Kodiak | Total all areas | Shumagin | Chirikof | Kodiak | Total all areas |
| -----Foreign groundfish vessels----- | | | | | | | | |
| Japan | | | | | | | | |
| SST | 0 | - | 0 | 0 | 0.00 | - | 0.00 | 0.00 |
| LST | 200 | 12 | 105 | 317 | 0.96 | 0.02 | 0.48 | 1.46 |
| LL | 0 | 0 | - | 0 | 0.00 | 0.00 | - | 0.00 |
| Republic of Korea (ROK) | | | | | | | | |
| LFT | 37 | 4 | - | 41 | 0.12 | 0.01 | - | 0.13 |
| SST | 7 | - | - | 7 | 0.05 | - | - | 0.05 |
| All nations total | 244 | 16 | 105 | 365 | 1.13 | 0.03 | 0.48 | 1.64 |
| Percent by area | 66.85 | 4.38 | 28.77 | | 68.90 | 1.83 | 29.27 | |
| -----Joint venture vessels----- | | | | | | | | |
| U.S.-Japan | - | 4,835 | 102 | 4,937 | - | 11.64 | 0.26 | 11.90 |
| U.S.-ROK | 171 | 188 | 0 | 359 | 0.52 | 0.61 | 0.00 | 1.13 |
| U.S.-Poland | 70 | 343 | 7,848 | 8,261 | 0.28 | 1.03 | 23.94 | 25.25 |
| U.S.-Taiwan | 0 | 62 | 118 | 180 | 0.00 | 0.22 | 0.36 | 0.58 |
| Joint venture total | 241 | 5,428 | 8,068 | 13,737 | 0.80 | 13.50 | 24.56 | 38.86 |
| Percent by area | 1.75 | 39.51 | 58.73 | | 2.06 | 34.74 | 63.20 | |

SST = Small stern trawlers
LST = Large surimi trawlers

LFT = Large freezer trawlers
LL = Longline vessels

Table C6.--The estimated incidental catch (numbers and metric tons) of pacific salmon in the foreign and joint venture groundfish fisheries in the Gulf of Alaska, 1977-85^{1/}.

| Year | Foreign | | Joint venture | | Total | |
|------|---------|--------|---------------|-----------|--------|--------|
| | Nos. | t | Nos. | t | Nos. | t |
| 1977 | 5,272 | 19.30 | NF | NF | 5,272 | 19.30 |
| 1978 | 45,603 | 131.27 | <u>2/</u> | <u>2/</u> | 45,603 | 131.27 |
| 1979 | 20,410 | 68.69 | 1,050 | 2.31 | 21,460 | 71.00 |
| 1980 | 35,901 | 106.90 | 168 | 1.07 | 36,069 | 107.97 |
| 1981 | 30,860 | 95.89 | 0 | 0 | 30,860 | 95.89 |
| 1982 | 5,556 | 18.89 | 1,411 | 2.77 | 6,967 | 21.66 |
| 1983 | 9,621 | 31.76 | 4,253 | 11.98 | 13,874 | 43.74 |
| 1984 | 12,001 | 36.13 | 63,845 | 168.97 | 75,846 | 205.10 |
| 1985 | 365 | 1.64 | 13,737 | 38.86 | 14,102 | 40.50 |

1/ Estimates for years 1977-84 are from Berger et al., 1985.

2/ No estimates of incidental catch were made of the limited joint venture fishery in 1978.

NF - No fishing.

Table C7.--Biological data on the incidental catch of Pacific salmon in the foreign and joint venture groundfish fishery in the Gulf of Alaska, 1985.

| Species | Percent by species | Sex | Sex composition | Average weight (kg) | Average length (cm) |
|--------------------------------------|-----------------------|----------|--------------------|------------------------|------------------------|
| -----Foreign directed fisheries----- | | | | | |
| Chinook | 95.68 | Male | 26.91 | 4.36 | 60.4 |
| | | Female | 62.39 | 4.79 | 65.6 |
| | | Unsexed | 10.71 | 3.15 | 61.3 |
| | | Combined | | 4.50 | 63.8 |
| Chum | 2.49 | Male | 20.67 | 3.60 | 64.0 |
| | | Female | 54.29 | 1.98 | 54.3 |
| | | Unsexed | 25.04 | 9.50 | 91.0 |
| | | Combined | | 4.20 | 65.5 |
| Coho | 1.83 | Male | 0.00 | -- | -- |
| | | Female | 65.97 | 7.30 | 82.6 |
| | | Unsexed | 34.03 | 1.60 | 57.0 |
| | | Combined | | 5.36 | 73.9 |
| -----Joint venture fisheries----- | | | | | |
| Chinook | 99.33 | Male | 39.61 | 2.75 | 56.6 |
| | | Female | 58.78 | 3.33 | 59.5 |
| | | Unsexed | 1.62 | 2.42 | 52.5 |
| | | Combined | | 3.08 | 58.2 |
| Chum | 0.48 | Male | 44.57 | 3.39 | 63.5 |
| | | Female | 46.95 | 3.66 | 67.3 |
| | | Unsexed | 8.48 | 2.16 | 53.3 |
| | | Combined | | 3.41 | 64.4 |
| Coho | 0.16 | Male | 35.98 | 2.58 | 50.9 |
| | | Female | 64.02 | 2.11 | 63.9 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 2.28 | 59.2 |
| Sockeye | 0.03 | Male | 19.59 | 2.30 | 63.0 |
| | | Female | 80.41 | 2.30 | 57.5 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 2.30 | 58.6 |

Table C8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985*. Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Small Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | NS | NS | -- | -- | 0.000 | 0.000 |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | 0.000 | 0.000 |
| NOV. | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| -----Japanese Surimi Large Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| OCT. | 0.042 | 7.861 | 0.000 | 0.000 | 0.000 | 0.000 |
| NOV. | 0.042 | 5.333 | -- | -- | -- | -- |
| DEC. | 0.001 | 1.800 | 0.000 | 0.000 | 0.000 | 0.000 |
| ANNUAL | 0.032 | 6.528 | 0.000 | 0.000 | 0.000 | 0.000 |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Longliners Fishing <500 M----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | 14.005 | 1.290 | 16.056 | 3.052 | -- | -- |
| MARCH | 10.475 | 1.678 | 16.307 | 2.336 | -- | -- |
| APRIL | 8.336 | 2.377 | 22.231 | 2.963 | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 11.908 | 1.529 | 16.215 | 2.864 | -- | -- |
| -----Republic of Korea Small Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | 1.340 | 2.295 | -- | -- | -- | -- |
| OCT. | 0.412 | 3.903 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.501 | 3.492 | -- | -- | -- | -- |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

Table C8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Republic of Korea Large Freezer Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | 0.058 | 4.000 | -- | -- | -- | -- |
| SEPT. | 0.386 | 3.742 | -- | -- | -- | -- |
| OCT. | 0.737 | 3.435 | NS | NS | -- | -- |
| NOV. | 0.587 | 3.908 | NS | NS | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.605 | 3.515 | NS | NS | -- | -- |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Republic of Korea JV Mothership----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | 0.001 | 1.214 | 0.005 | 0.500 |
| MARCH | -- | -- | <0.001 | 1.911 | 0.000 | 0.000 |
| APRIL | 2.327 | 1.890 | 0.000 | 0.000 | -- | -- |
| MAY | 1.622 | 5.400 | -- | -- | -- | -- |
| JUNE | 0.182 | 3.640 | -- | -- | -- | -- |
| JULY | NS | NS | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.063 | 20.349 | 0.456 | 9.860 | 1.135 | 38.476 |
| OCT. | 1.979 | 3.273 | NS | NS | -- | -- |
| NOV. | 1.919 | 3.832 | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 1.746 | 3.203 | 0.001 | 3.438 | 0.026 | 36.242 |
| -----U.S.-Japan JV Mothership----- | | | | | | |
| JAN. | -- | -- | 0.005 | 1.650 | -- | -- |
| FEB. | -- | -- | 0.001 | 2.045 | 0.000 | 0.000 |
| MARCH | -- | -- | 0.002 | 0.835 | 0.003 | 0.710 |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | 16.279 | 5.525 |
| NOV. | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | -- | -- | 0.002 | 1.500 | 0.838 | 5.518 |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|-------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Poland JV Mothership----- | | | | | | |
| JAN. | -- | -- | 0.030 | 1.730 | -- | -- |
| FEB. | -- | -- | 0.004 | 3.088 | 0.013 | 0.79 |
| MARCH | -- | -- | 0.004 | 0.873 | 0.012 | 0.56 |
| APRIL | -- | -- | <0.001 | 1.800 | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | 1.157 | 3.114 | NS | NS | 6.360 | 3.59 |
| NOV. | 1.705 | 2.124 | 6.118 | 3.821 | 3.225 | 4.30 |
| DEC. | -- | -- | -- | -- | 8.384 | 3.08 |
| ANNUAL | 1.362 | 2.650 | 0.008 | 2.728 | 3.864 | 3.78 |
| -----U.S.-Taiwan JV Mothership----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | 9.094 | 3.177 | 8.264 | 2.88 |
| JUNE | 11.854 | 2.657 | 13.506 | 4.795 | 4.311 | 5.51 |
| JULY | 1.818 | 13.720 | 3.747 | 4.218 | 4.251 | 3.01 |
| AUG. | -- | -- | 3.883 | 4.594 | 7.480 | 3.21 |
| SEPT. | NS | NS | 4.418 | 3.468 | 6.281 | 4.19 |
| OCT. | -- | -- | -- | -- | 11.373 | 5.30 |
| NOV. | -- | -- | -- | -- | 3.113 | 5.84 |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 9.700 | 3.102 | 4.290 | 4.157 | 7.549 | 4.59 |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

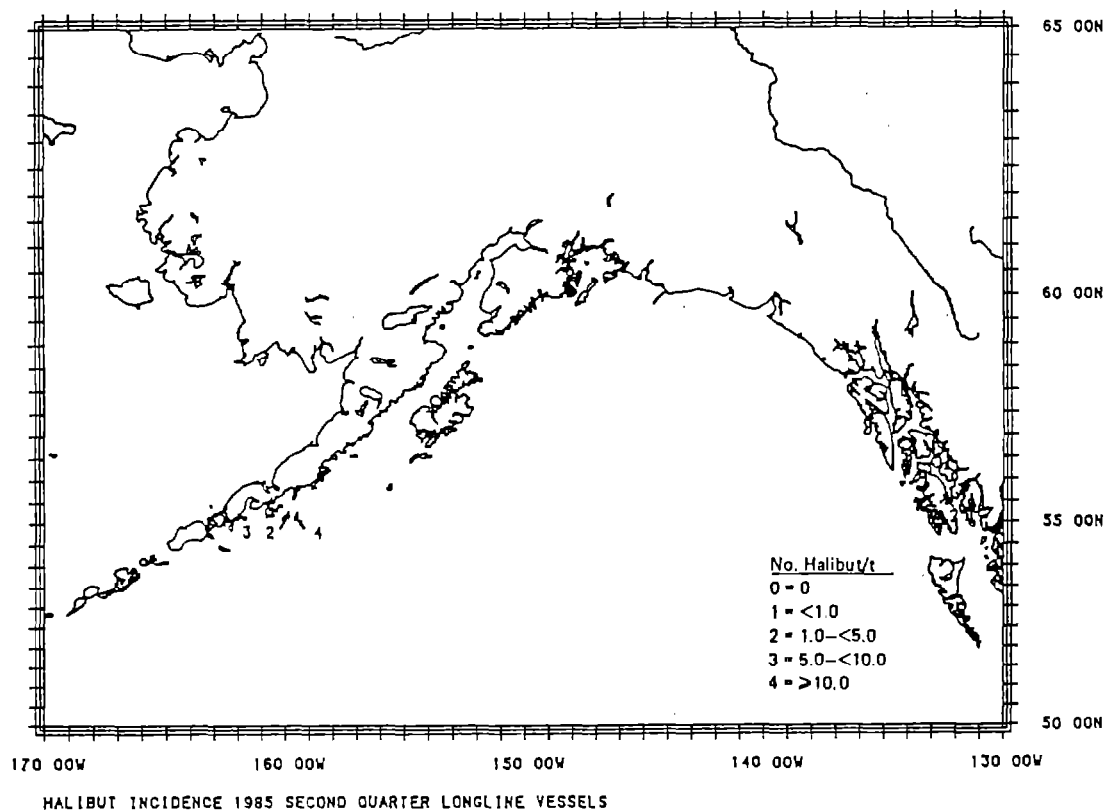
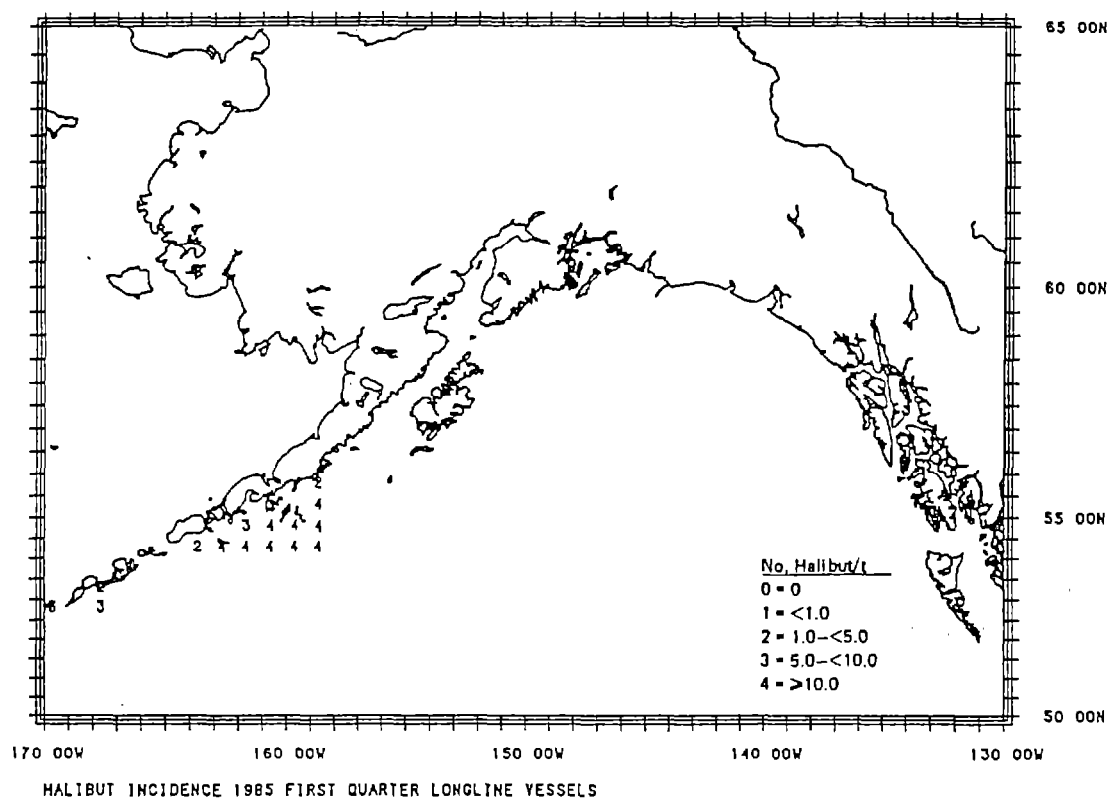


Figure C4.--Average incidence (no./t) of Pacific halibut on longline vessels (all nations) by quarter and 1/2° lat. by 1° long. areas, 1985.

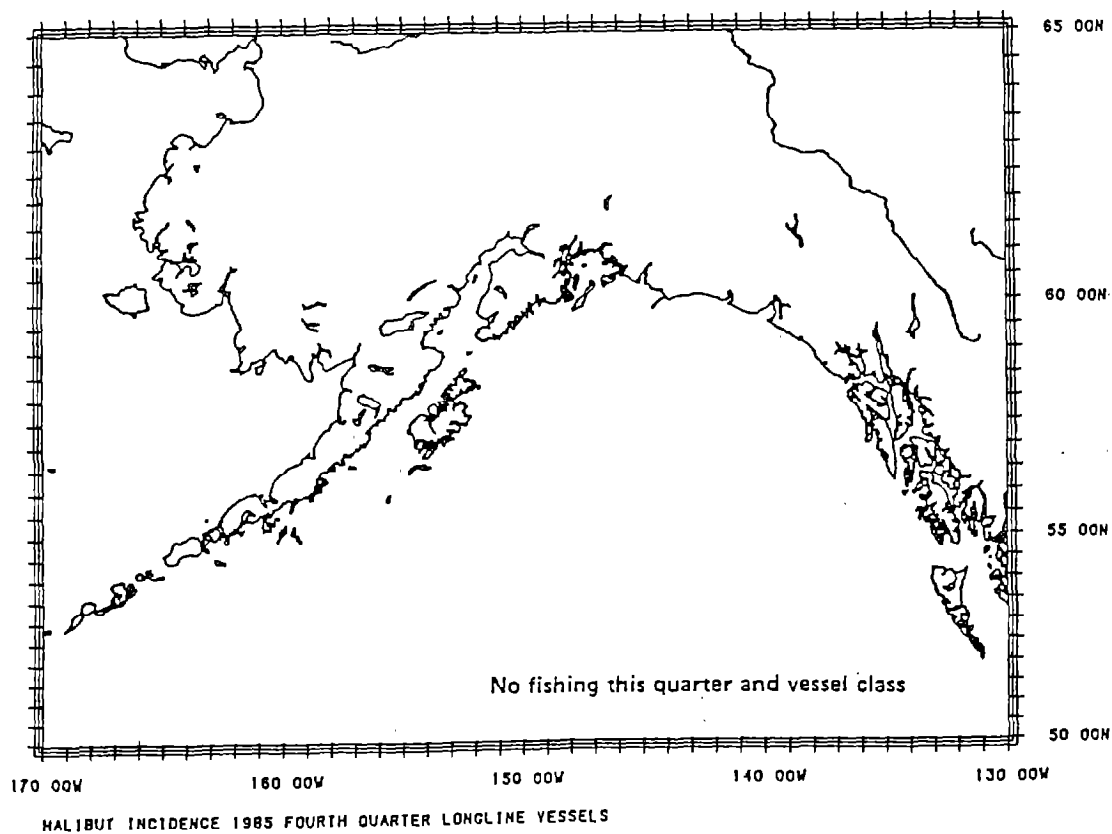
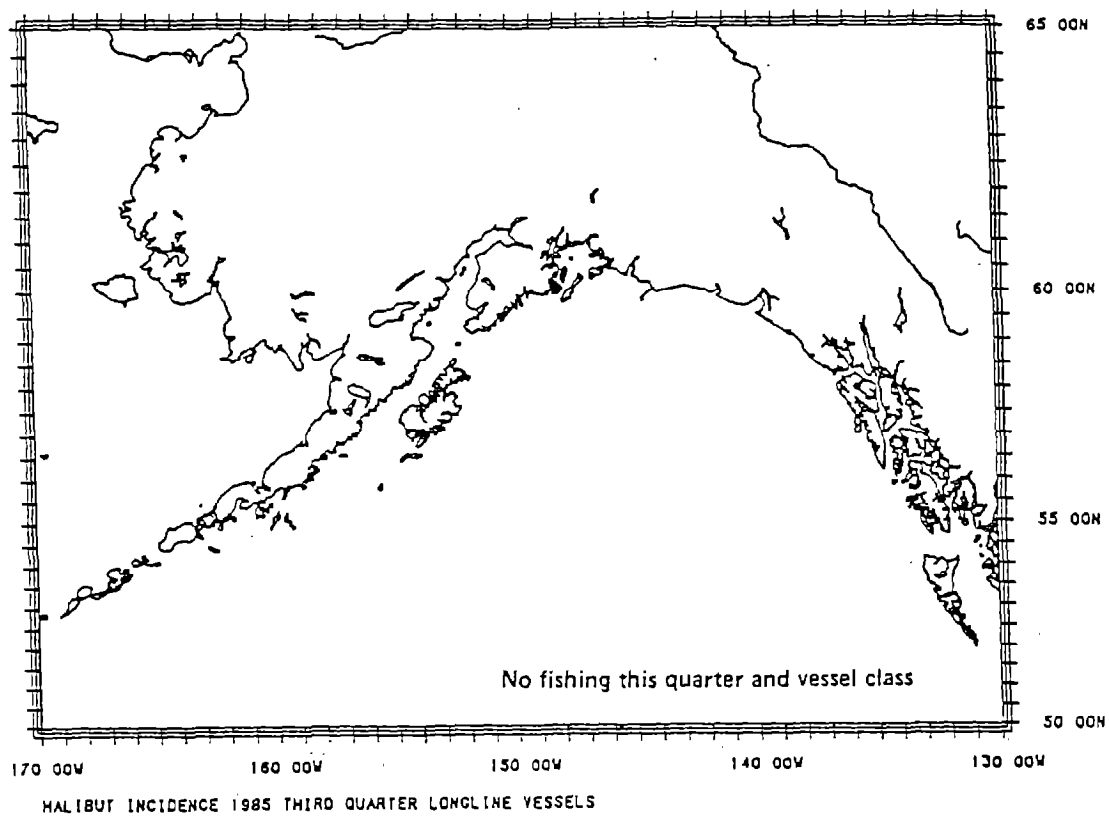


Figure C4. --Continued.

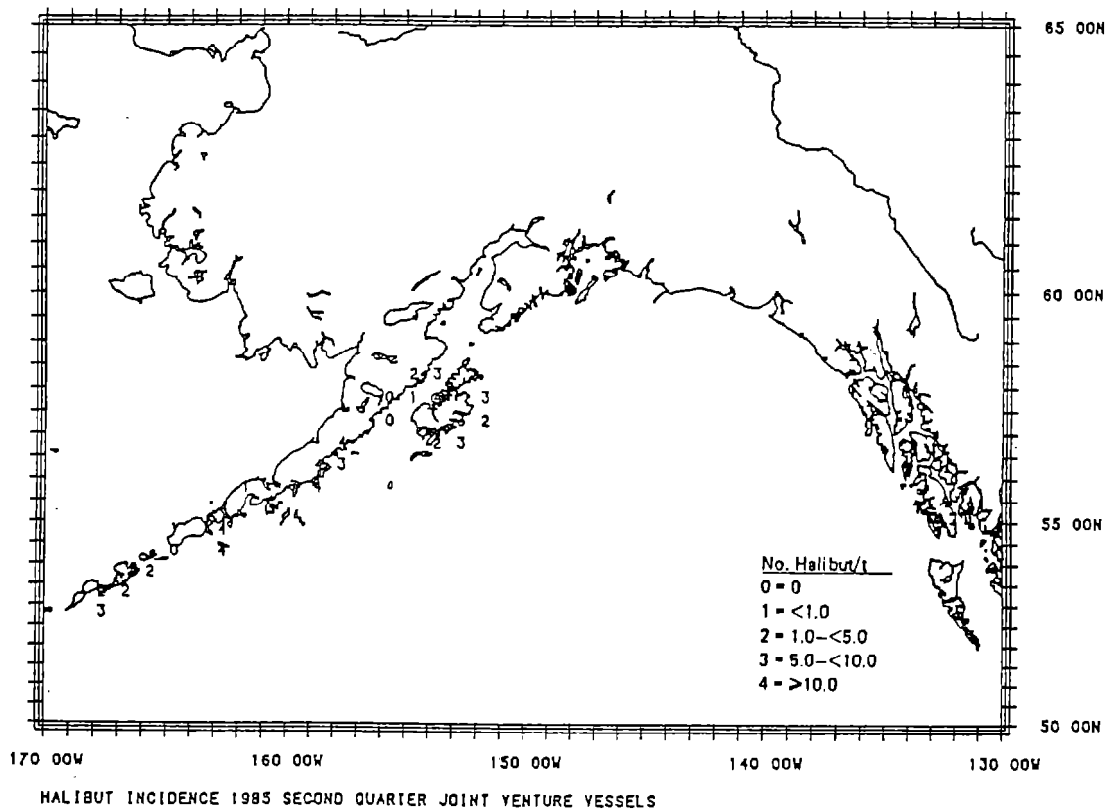
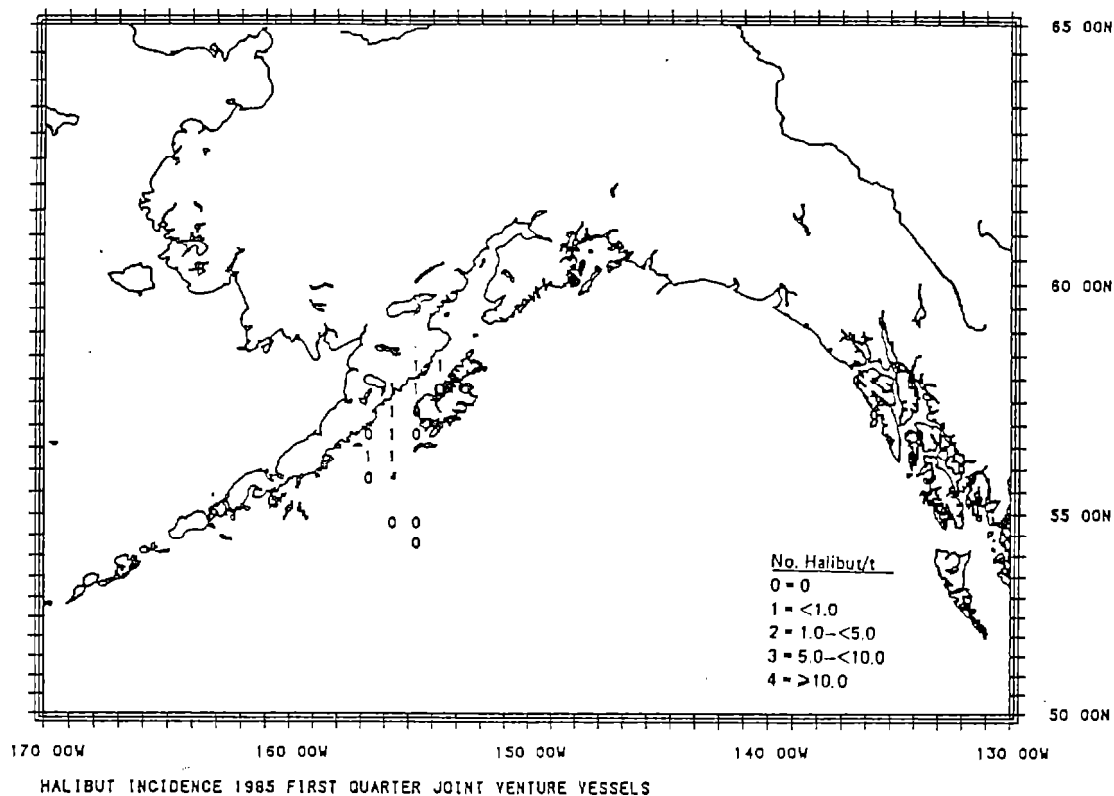


Figure C5. --Average incidence (no./t) of Pacific halibut on joint venture vessels (all nations) by quarter and 1/2° lat. by 1° long. areas, 1985.

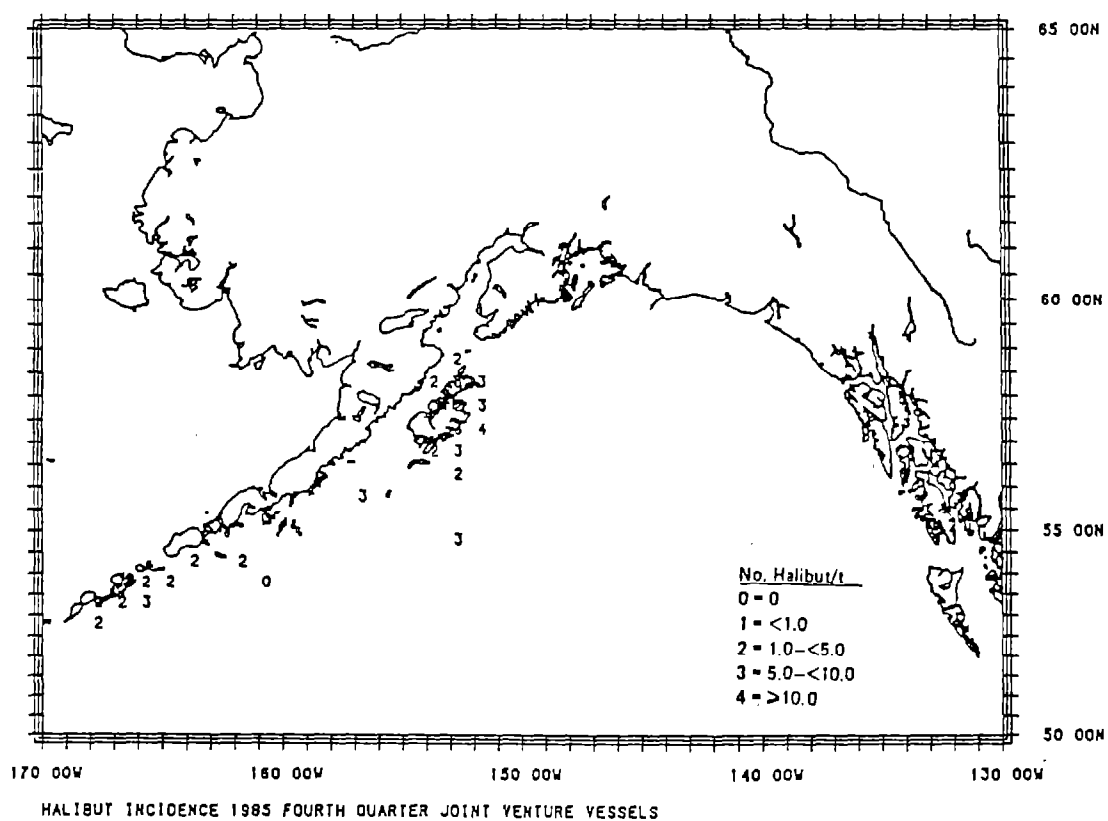
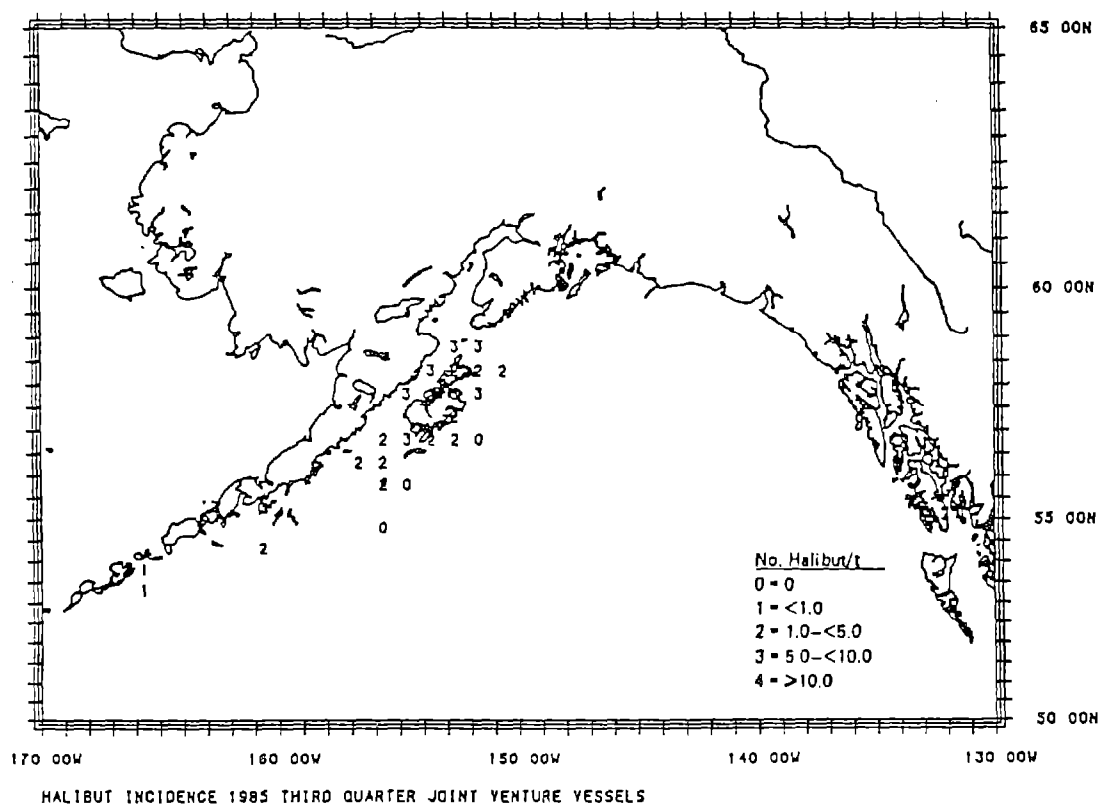


Figure C5. --Continued.

Table C9.--Estimated incidental catches of Pacific halibut (in numbers of fish and metric tons)
by foreign groundfish and joint venture vessels in the Gulf of Alaska, 1985.

| | Number of fish | | | | Weight (metric tons) | | | |
|--------------------------------------|----------------|----------|--------|--------------------|----------------------|----------|--------|--------------------|
| | Shumagin | Chirikof | Kodiak | Total all areas | Shumagin | Chirikof | Kodiak | Total all areas |
| -----Foreign groundfish vessels----- | | | | | | | | |
| Japan | | | | | | | | |
| SST | 0 | - | 0 | 0 | 0.00 | - | 0.00 | 0.00 |
| LST | 534 | 0 | 0 | 534 | 3.46 | 0.00 | 0.00 | 3.46 |
| LL | 89,503 | 28,783 | - | 118,286 | 133.20 | 83.46 | - | 216.66 |
| Republic of Korea (ROK) | | | | | | | | |
| LFT | 5,098 | 640 | - | 5,738 | 17.63 | 2.20 | - | 19.83 |
| SST | 228 | - | - | 228 | 0.89 | - | - | 0.89 |
| All nations total | 95,363 | 29,423 | 0 | 124,786 | 155.18 | 85.66 | 0.00 | 240.84 |
| Percent by area | 76.42 | 23.58 | 0.00 | | 64.43 | 35.57 | 0.00 | |
| -----Joint venture vessels----- | | | | | | | | |
| U.S.-Japan | - | 184 | 3,072 | 3,256 | - | 0.30 | 16.92 | 17.22 |
| U.S.-ROK | 24,123 | 40 | 62 | 24,225 | 79.59 | 0.11 | 2.36 | 82.06 |
| U.S.-Poland | 2,301 | 2,452 | 21,057 | 25,810 | 5.98 | 9.21 | 79.13 | 94.32 |
| U.S.-Taiwan | 98 | 4,085 | 21,010 | 25,193 | 0.28 | 17.01 | 89.41 | 106.70 |
| Joint venture total | 26,522 | 6,761 | 45,201 | 78,484 | 85.85 | 26.63 | 187.82 | 300.30 |
| Percent by area | 33.79 | 8.61 | 57.59 | | 28.59 | 8.87 | 62.54 | |

SST = Small stern trawlers
LST = Large surimi trawlers

LFT = Large freezer trawlers
LL = Longline vessels

Table C10.--The estimated incidental catch (numbers and metric tons) of Pacific halibut in the foreign and joint venture groundfish fisheries in the Gulf of Alaska, 1977-85^{1/}.

| Year | Foreign | | Joint venture | | Total | |
|------|---------|-------|---------------|-----------|---------|-------|
| | Nos. | t | Nos. | t | Nos. | t |
| 1977 | 413,009 | 2,200 | NF | NF | 413,009 | 2,200 |
| 1978 | 293,374 | 1,289 | <u>2/</u> | <u>2/</u> | 293,374 | 1,289 |
| 1979 | 249,641 | 2,576 | 5,127 | 21.49 | 254,768 | 2,597 |
| 1980 | 511,521 | 3,205 | 19,318 | 48.50 | 530,839 | 3,254 |
| 1981 | 417,311 | 2,499 | 274 | 4.81 | 417,585 | 2,504 |
| 1982 | 562,196 | 2,690 | 2,371 | 3.60 | 564,567 | 2,694 |
| 1983 | 689,688 | 3,235 | 98,571 | 356.49 | 788,259 | 3,592 |
| 1984 | 361,913 | 1,506 | 165,721 | 589.66 | 527,634 | 2,096 |
| 1985 | 124,786 | 241 | 78,484 | 300.30 | 203,270 | 541 |

1/ Estimates for years 1977-84 are from Berger et al., 1985.

2/ No estimates of incidental catch were made of the limited joint venture fishery in 1978.

NF - No fishing.

Table C11.--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985*. Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Small Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | NS | NS | -- | -- | 0.000 | 0.000 |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | 0.000 | 0.000 |
| NOV. | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| -----Japanese Surimi Large Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| OCT. | 0.004 | 0.026 | 0.000 | 0.000 | 0.000 | 0.000 |
| NOV. | 0.002 | 0.085 | -- | -- | -- | -- |
| DEC. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| ANNUAL | 0.002 | 0.047 | 0.000 | 0.000 | 0.000 | 0.000 |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C11 .--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Longliners Fishing <500 M----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | 0.026 | 0.816 | 0.010 | 0.661 | -- | -- |
| MARCH | 0.045 | 0.724 | 0.014 | 0.350 | -- | -- |
| APRIL | 0.010 | 0.350 | 0.000 | 0.000 | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.035 | 0.747 | 0.011 | 0.563 | -- | -- |
| -----Republic of Korea Small Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.000 | 0.000 | -- | -- | -- | -- |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

Table C11 .--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Republic of Korea Large Freezer Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | 0.000 | 0.000 | -- | -- | -- | -- |
| SEPT. | 0.014 | 0.265 | -- | -- | -- | -- |
| OCT. | 0.028 | 0.348 | NS | NS | -- | -- |
| NOV. | 0.196 | 0.425 | NS | NS | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.026 | 0.342 | NS | NS | -- | -- |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C11 .--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Republic of Korea JV Mothership----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| APRIL | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| MAY | 0.000 | 0.000 | -- | -- | -- | -- |
| JUNE | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | NS | NS | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | 0.912 | 1.100 | 10.922 | 0.599 |
| OCT. | 0.022 | 0.659 | NS | NS | -- | -- |
| NOV. | 0.000 | 0.000 | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.015 | 0.659 | <0.001 | 1.100 | 0.235 | 0.599 |
| -----U.S.-Japan JV Mothership----- | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | -- | -- |
| FEB. | -- | -- | <0.001 | 0.047 | 0.000 | 0.000 |
| MARCH | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | 63.159 | 0.110 |
| NOV. | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | -- | -- | <0.001 | 0.047 | 3.248 | 0.110 |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C11.--Incidence (number per metric ton of catch) and average weight (kg) of Tanner crab taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| Shumagin | | Chirikof | | Kodiak | |
|-------------------------------------|----------------|-----------|----------------|-----------|----------------|
| Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Poland JV Mothership----- | | | | | |
| JAN. | -- | 0.000 | 0.000 | -- | -- |
| FEB. | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| APRIL | -- | <0.001 | 0.100 | -- | -- |
| MAY | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- |
| OCT. | 0.040 | NS | NS | 1.758 | 0.678 |
| NOV. | 0.000 | 6.588 | 1.007 | 0.883 | 0.431 |
| DEC. | -- | -- | -- | 2.121 | 1.113 |
| ANNUAL | 0.025 | 0.004 | 0.991 | 1.040 | 0.668 |
| -----U.S.-Taiwan JV Mothership----- | | | | | |
| JAN. | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- |
| MAY | -- | 6.798 | 0.442 | 35.258 | 0.098 |
| JUNE | 40.221 | 6.040 | 0.259 | 69.958 | 0.088 |
| JULY | 0.909 | 1.306 | 0.756 | 1.504 | 0.681 |
| AUG. | -- | 1.037 | 0.650 | 29.912 | 0.087 |
| SEPT. | NS | 0.544 | 0.726 | 3.817 | 0.214 |
| OCT. | -- | -- | -- | 12.758 | 0.344 |
| NOV. | -- | -- | -- | 3.389 | 0.214 |
| DEC. | -- | -- | -- | -- | -- |
| ANNUAL | 31.784 | 1.453 | 0.648 | 15.988 | 0.174 |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

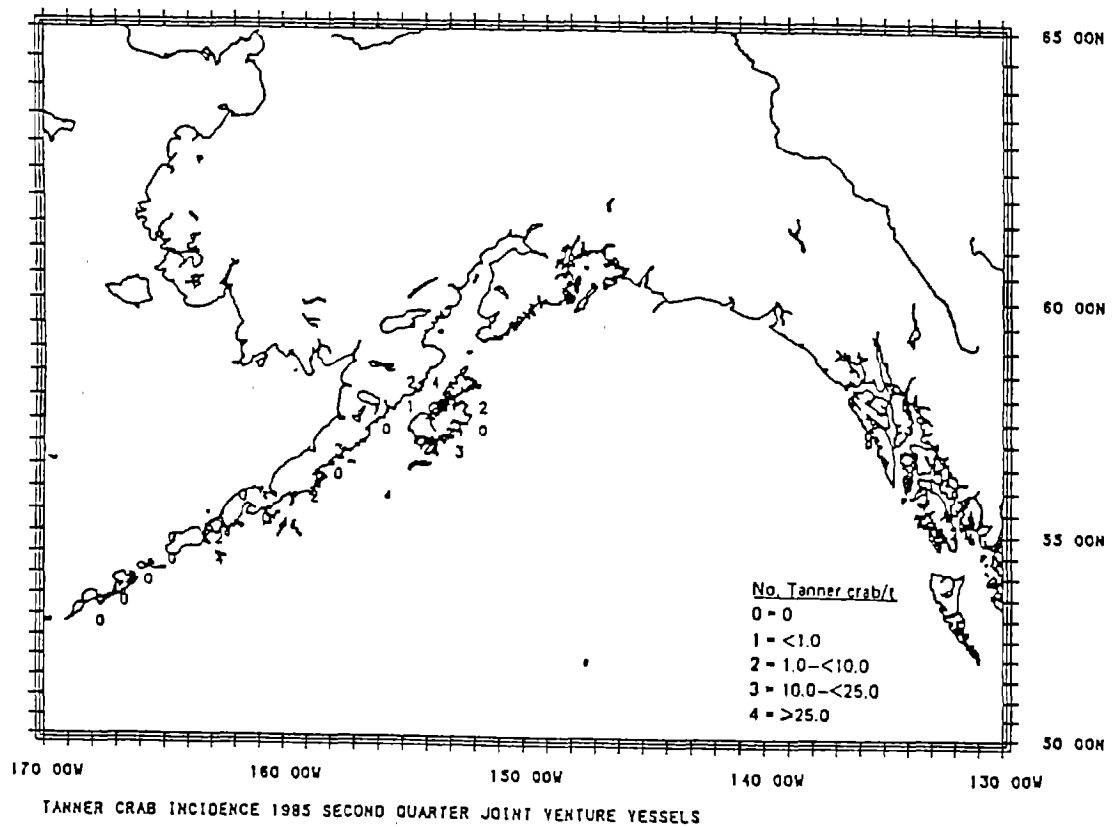
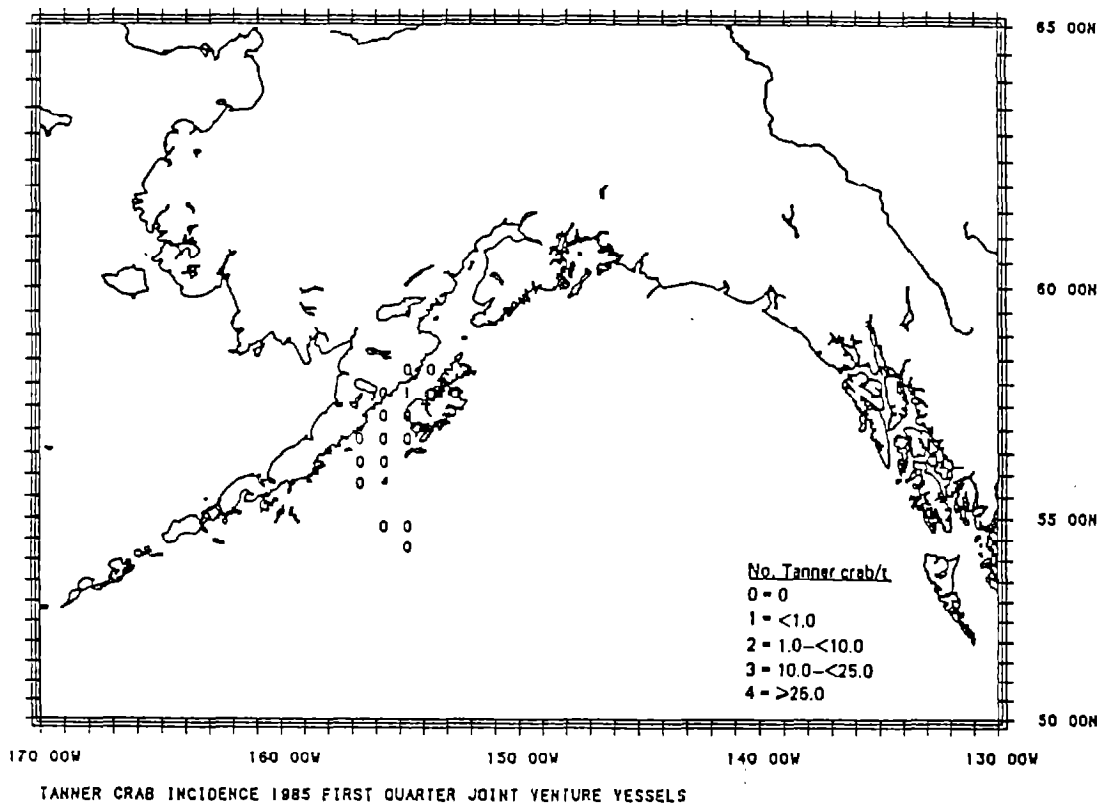


Figure C6.--Average incidence (no./t) of Tanner crab on joint venture vessels (all nations) by quarter and 1/2° lat by 1° long. areas, 1985.

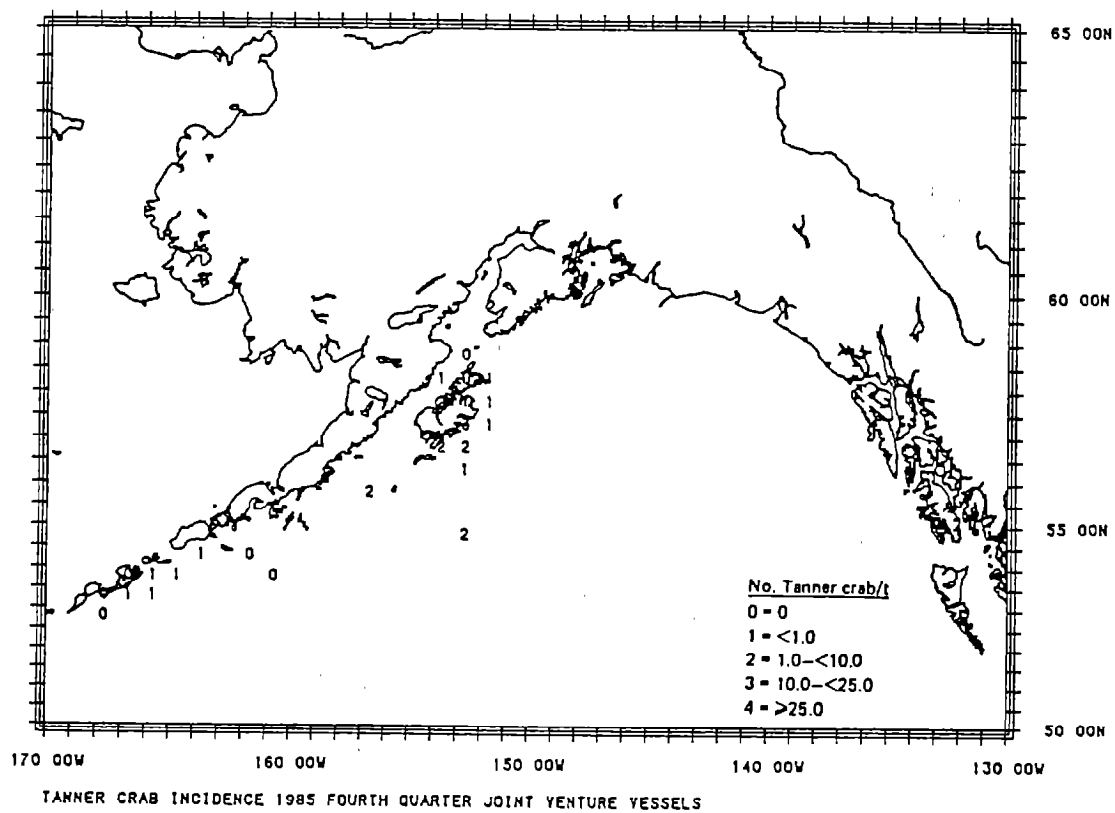
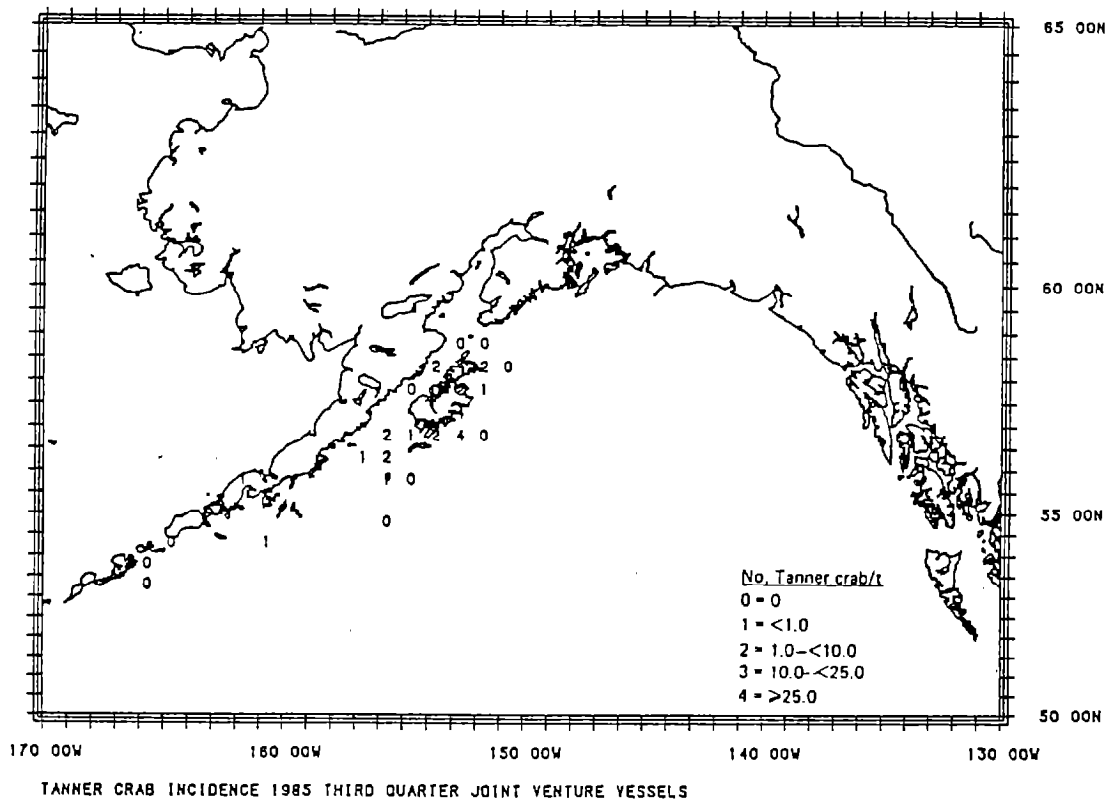


Figure C6.--Continued.

Table C12.--Estimated incidental catches of Tanner crab (in numbers of crab and metric tons)
by foreign groundfish and joint venture vessels in the Gulf of Alaska, 1985.

| | Number of crab | | | | Weight (metric tons) | | | |
|--------------------------------------|----------------|----------|--------|--------------------|----------------------|----------|--------|--------------------|
| | Shumagin | Chirikof | Kodiak | Total all areas | Shumagin | Chirikof | Kodiak | Total all areas |
| -----Foreign groundfish vessels----- | | | | | | | | |
| Japan | | | | | | | | |
| SST | 0 | - | 0 | 0 | 0.00 | - | 0.00 | 0.00 |
| LST | 32 | 0 | 0 | 32 | <0.01 | 0.00 | 0.00 | <0.01 |
| LL | 242 | 19 | - | 261 | 0.19 | 0.01 | - | 0.20 |
| Republic of Korea (ROK) | | | | | | | | |
| LFT | 192 | 24 | - | 216 | 0.07 | 0.01 | - | 0.08 |
| SST | 0 | - | - | 0 | 0.00 | - | - | 0.00 |
| All nations total | 466 | 43 | 0 | 509 | 0.26 | 0.02 | 0.00 | 0.28 |
| Percent by area | 91.55 | 8.45 | 0.00 | | 92.86 | 7.14 | 0.00 | |
| -----Joint venture vessels----- | | | | | | | | |
| U.S.-Japan | - | 7 | 11,875 | 11,882 | - | <0.01 | 1.31 | 1.31 |
| U.S.-ROK | 233 | 9 | 590 | 832 | 0.15 | 0.01 | 0.35 | 0.51 |
| U.S.-Poland | 38 | 2,559 | 5,675 | 8,272 | 0.01 | 2.58 | 3.83 | 6.42 |
| U.S.-Taiwan | 329 | 1,344 | 41,981 | 43,654 | 0.07 | 0.92 | 7.38 | 8.37 |
| Joint venture total | 600 | 3,919 | 60,121 | 64,640 | 0.23 | 3.51 | 12.87 | 16.61 |
| Percent by area | 0.93 | 6.06 | 93.01 | | 1.38 | 21.13 | 77.48 | |

SST = Small stern trawlers
LST = Large surimi trawlers

LFT = Large freezer trawlers
LL = Longline vessels

Table C13.--Estimated incidental catches (numbers and metric tons) of Tanner crab in the foreign and joint venture groundfish fisheries in the Gulf of Alaska, 1978-85^{1/}.

| Year | Foreign | | Joint venture | | Total | |
|------|---------|-------|---------------|-----------|---------|-------|
| | Nos. | t | Nos. | t | Nos. | t |
| 1978 | 23,969 | 14.16 | <u>2/</u> | <u>2/</u> | 23,969 | 14.16 |
| 1979 | 16,992 | 11.30 | 626 | 0.25 | 17,618 | 11.55 |
| 1980 | 27,844 | 16.62 | 58,022 | 14.43 | 85,866 | 31.05 |
| 1981 | 96,662 | 70.19 | 0 | 0 | 96,662 | 70.19 |
| 1982 | 63,293 | 35.33 | 364 | 0.17 | 63,657 | 35.50 |
| 1983 | 30,609 | 22.42 | 102,840 | 54.87 | 133,449 | 77.29 |
| 1984 | 8,885 | 5.69 | 41,663 | 27.36 | 50,548 | 33.05 |
| 1985 | 509 | 0.28 | 64,640 | 16.61 | 65,149 | 16.89 |

1/ Estimates for years 1978-84 are from Berger et al., 1985.

2/ No estimates of incidental catch were made of the limited joint venture fishery in 1978.

Table C14.--Biological data on the incidental catch of Tanner crab in the foreign and joint venture groundfish fishery in the Gulf of Alaska, 1985.

| Species | Percent by species | Sex | Sex composition | Average weight (kg) | Average width (mm) |
|---|-----------------------|----------|--------------------|------------------------|-----------------------|
| -----Foreign directed fisheries----- | | | | | |
| <u>Chionoecetes</u> <u>bairdi</u> | 67.42 | Male | 82.92 | 0.65 | 120 |
| | | Female | 11.02 | 0.34 | 74 |
| | | Unsexed | 6.06 | 0.52 | 86 |
| | | Combined | | 0.61 | 113 |
| <u>Chionoecetes</u> <u>opilio</u> | 32.58 | Male | 100.00 | 0.40 | 34 |
| | | Female | 0.00 | -- | -- |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 0.40 | 34 |
| -----Joint venture fisheries----- | | | | | |
| <u>Chionoecetes</u> <u>bairdi</u> | 99.52 | Male | 38.61 | 0.72 | 106 |
| | | Female | 49.52 | 0.29 | 80 |
| | | Unsexed | 11.87 | 0.74 | 99 |
| | | Combined | | 0.51 | 92 |
| <u>Chionoecetes</u> <u>opilio</u> | 0.09 | Male | 100.00 | 0.29 | 83 |
| | | Female | 0.00 | -- | -- |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 0.29 | 83 |
| <u>Chionoecetes</u> <u>tanneri</u> | 0.02 | Male | 100.00 | 0.24 | 80 |
| | | Female | 0.00 | -- | -- |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 0.24 | 80 |
| <u>Chionoecetes</u> <u>angulatus</u> | 0.36 | Male | 95.82 | 0.79 | 112 |
| | | Female | 4.18 | 0.40 | 80 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 0.78 | 111 |

Table C15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985*. Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Small Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | NS | NS | -- | -- | 0.000 | 0.000 |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | 0.000 | 0.000 |
| NOV. | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.000 | 0.000 | -- | -- | 0.000 | 0.000 |
| -----Japanese Surimi Large Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| OCT. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| NOV. | 0.000 | 0.000 | -- | -- | -- | -- |
| DEC. | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| ANNUAL | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Japanese Longliners Fishing <500 M----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| MARCH | 0.003 | 0.667 | 0.000 | 0.000 | -- | -- |
| APRIL | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.002 | 0.667 | 0.000 | 0.000 | | |
| -----Republic of Korea Small Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.000 | 0.000 | -- | -- | -- | -- |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

Table C15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|---|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----Republic of Korea Large Freezer Trawler----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | 0.000 | 0.000 | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | NS | NS | -- | -- |
| NOV. | 0.000 | 0.000 | NS | NS | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.000 | 0.000 | NS | NS | -- | -- |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Republic of Korea JV Mothership----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| APRIL | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| MAY | 0.000 | 0.000 | -- | -- | -- | -- |
| JUNE | 0.327 | 0.867 | -- | -- | -- | -- |
| JULY | NS | NS | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | 0.000 | 0.000 | 0.000 | 0.000 | 0.284 | 5.500 |
| OCT. | 0.001 | 2.039 | NS | NS | -- | -- |
| NOV. | 0.000 | 0.000 | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.002 | 1.281 | 0.000 | 0.000 | 0.006 | 5.500 |
| -----U.S.-Japan JV Mothership----- | | | | | | |
| JAN. | -- | -- | 0.018 | 1.505 | -- | -- |
| FEB. | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | 0.000 | 0.000 |
| NOV. | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | -- | -- | <0.001 | 1.505 | 0.000 | 0.000 |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C15.--Incidence (number per metric ton of catch) and average weight (kg) of king crab taken in the foreign and joint venture groundfish catches in the Gulf of Alaska, 1985. (Continued)* Lines indicate areas not fished.

| | Shumagin | | Chirikof | | Kodiak | |
|-------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average weight | Incidence | Average weight | Incidence | Average weight |
| -----U.S.-Poland JV Mothership----- | | | | | | |
| JAN. | -- | -- | 0.000 | 0.000 | -- | -- |
| FEB. | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| MARCH | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 |
| APRIL | -- | -- | 0.000 | 0.000 | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | -- | -- | -- | -- |
| JULY | -- | -- | -- | -- | -- | -- |
| AUG. | -- | -- | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | NS | NS | 0.111 | 1.903 |
| NOV. | 0.000 | 0.000 | 0.824 | 3.857 | 0.090 | 2.554 |
| DEC. | -- | -- | -- | -- | 0.012 | 2.480 |
| ANNUAL | 0.000 | 0.000 | 0.001 | 3.857 | 0.070 | 2.379 |
| -----U.S.-Taiwan JV Mothership----- | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | 0.000 | 0.000 | 0.003 | 1.649 |
| JUNE | 0.000 | 0.000 | 0.021 | 2.200 | 0.000 | 0.000 |
| JULY | 0.000 | 0.000 | 0.809 | 4.411 | 0.127 | 2.618 |
| AUG. | -- | -- | 2.502 | 2.482 | 0.256 | 2.421 |
| SEPT. | NS | NS | 0.705 | 1.443 | 0.121 | 3.341 |
| OCT. | -- | -- | -- | -- | 0.548 | 2.886 |
| NOV. | -- | -- | -- | -- | 0.039 | 3.310 |
| DEC. | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.000 | 0.000 | 0.906 | 3.609 | 0.229 | 2.897 |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern INPFC areas in 1985.

NS = Fishing occurred but no sampling by U.S. observers.

Table C16.--Estimated incidental catches of king crab (in numbers of crab and metric tons) by foreign groundfish and joint venture vessels in the Gulf of Alaska, 1985.

| | Number of crab | | | | Weight (metric tons) | | | |
|--------------------------------------|----------------|----------|--------|--------------------|----------------------|----------|--------|--------------------|
| | Shumagin | Chirikof | Kodiak | Total all areas | Shumagin | Chirikof | Kodiak | Total all areas |
| -----Foreign groundfish vessels----- | | | | | | | | |
| Japan | | | | | | | | |
| SST | 0 | - | 0 | 0 | 0.00 | - | 0.00 | 0.00 |
| LST | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 |
| LL | 10 | 0 | - | 10 | 0.01 | 0.00 | - | 0.01 |
| Republic of Korea (ROK) | | | | | | | | |
| LFT | 0 | 0 | - | 0 | 0.00 | 0.00 | - | 0.00 |
| SST | 0 | - | - | 0 | 0.00 | - | - | 0.00 |
| All nations total | 10 | 0 | 0 | 10 | 0.01 | 0.00 | 0.00 | 0.01 |
| Percent by area | 100.00 | 0.00 | 0.00 | | 100.00 | 0.00 | 0.00 | |
| -----Joint venture vessels----- | | | | | | | | |
| U.S.-Japan | - | 63 | 0 | 63 | - | 0.10 | 0.00 | 0.10 |
| U.S.-ROK | 9 | 0 | 15 | 24 | 0.02 | 0.00 | 0.08 | 0.10 |
| U.S.-Poland | 0 | 320 | 374 | 694 | 0.00 | 1.23 | 0.87 | 2.10 |
| U.S.-Taiwan | 0 | 974 | 672 | 1,646 | 0.00 | 3.46 | 1.93 | 5.39 |
| Joint venture total | 9 | 1,357 | 1,061 | 2,427 | 0.02 | 4.79 | 2.88 | 7.69 |
| Percent by area | 0.37 | 55.91 | 43.72 | | 0.26 | 62.29 | 37.45 | |

SST = Small stern trawlers
LST = Large surimi trawlers

LFT = Large freezer trawlers
LL = Longline vessels

Table C17.--The estimated incidental catch (numbers and metric tons) of king crab in the foreign and joint venture groundfish fisheries in the Gulf of Alaska, 1978-85^{1/}.

| Year | Foreign | | Joint venture | | Total | |
|------|---------|--------|---------------|-----------|--------|--------|
| | Nos. | t | Nos. | t | Nos. | t |
| 1978 | 93,875 | 135.31 | <u>2/</u> | <u>2/</u> | 93,875 | 135.31 |
| 1979 | 24,094 | 40.30 | 466 | 0.83 | 24,560 | 41.13 |
| 1980 | 6,395 | 8.95 | 6,285 | 13.03 | 12,680 | 21.98 |
| 1981 | 6,619 | 8.01 | 0 | 0.00 | 6,619 | 8.01 |
| 1982 | 3,464 | 5.60 | 11 | 0.03 | 3,475 | 5.63 |
| 1983 | 2,124 | 3.00 | 4,454 | 15.01 | 6,578 | 18.01 |
| 1984 | 1,465 | 4.89 | 5,482 | 20.15 | 6,947 | 25.04 |
| 1985 | 10 | 0.01 | 2,427 | 7.69 | 2,437 | 7.70 |

^{1/} Estimates for 1978-84 are from Berger et al., 1985.

^{2/} No estimates of incidental catch were made of the limited joint venture fishery in 1978.

Table C18.--Biological data on the incidental catch of king crab in the foreign and joint venture groundfish fishery in the Gulf of Alaska, 1985.

| Species | Percent by species | Sex | Sex composition | Average weight (kg) | Average length (mm) |
|--------------------------------------|-----------------------|----------|--------------------|------------------------|------------------------|
| -----Foreign directed fisheries----- | | | | | |
| Blue | 100.00 | Male | 100.0 | 0.67 | 101 |
| | | Female | 0.0 | -- | -- |
| | | Unsexed | 0.0 | -- | -- |
| | | Combined | | 0.67 | 101 |
| -----Joint venture fisheries----- | | | | | |
| Red | 99.55 | Male | 60.89 | 4.21 | 196 |
| | | Female | 36.39 | 2.21 | 142 |
| | | Unsexed | 2.72 | 2.01 | 180 |
| | | Combined | | 3.42 | 176 |
| Blue | 0.10 | Male | 100.00 | 5.20 | 170 |
| | | Female | 0.00 | -- | -- |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 5.20 | 170 |
| Golden | 0.35 | Male | 31.84 | 2.83 | 168 |
| | | Female | 68.16 | 2.06 | 154 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 2.31 | 158 |

Table C19.--The common and scientific names of rockfish identified in the 1985 foreign and joint venture catches in the Gulf of Alaska.

| Common name ^{1/} | Scientific name |
|------------------------------|--------------------------------|
| Black rockfish | <u>Sebastes melanops</u> |
| Blue rockfish | <u>Sebastes mystinus</u> |
| Darkblotched rockfish | <u>Sebastes crameri</u> |
| Dusky rockfish | <u>Sebastes ciliatus</u> |
| Harlequin rockfish | <u>Sebastes variegatus</u> |
| Northern rockfish | <u>Sebastes polyspinis</u> |
| Pacific ocean perch | <u>Sebastes alutus</u> |
| Rougheye rockfish | <u>Sebastes aleutianus</u> |
| Sharpchin rockfish | <u>Sebastes zacentrus</u> |
| Shortraker rockfish | <u>Sebastes borealis</u> |
| Shortspine rockfish | <u>Sebastolobus alascanus</u> |
| Splitnose rockfish | <u>Sebastes diploproa</u> |
| Widow rockfish | <u>Sebastes entomelas</u> |
| Yelloweye rockfish | <u>Sebastes ruberrimus</u> |
| Yellowtail rockfish | <u>Sebastes flavidus</u> |
| Other rockfish ^{2/} | |
| Chilipepper | <u>Sebastes goodei</u> |
| Copper rockfish | <u>Sebastes caurinus</u> |
| Redbanded rockfish | <u>Sebastes babcocki</u> |
| Redstripe rockfish | <u>Sebastes proriger</u> |
| Rosethorn rockfish | <u>Sebastes helvomaculatus</u> |
| Silvergray rockfish | <u>Sebastes brevispinis</u> |
| Yellowmouth rockfish | <u>Sebastes reedi</u> |

1/ With all rockfish, the possibility of misidentification exists, and the listing of species not previously reported from the Gulf of Alaska should be noted with caution.

2/ The 7 species listed under "other rockfish" each made up less than 0.10% of the rockfish catch by foreign vessels.

Table C20.--Estimated catch of rockfish by species and area in the Gulf of Alaska during 1985^{1/}.

| Common name | Shumagin | | Chirikof | | Kodiak | | Total | |
|--------------------------------------|----------|-------|----------|-------|--------|-------|--------|-------|
| | t | % | t | % | t | % | t | % |
| -----Foreign directed fisheries----- | | | | | | | | |
| Blue rockfish | 0.04 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.30 |
| Dusky rockfish | 1.03 | 9.28 | 0.07 | 21.87 | 0.04 | 2.01 | 1.14 | 8.50 |
| Northern rockfish | 0.26 | 2.34 | 0.03 | 9.38 | 0.00 | 0.00 | 0.29 | 2.16 |
| Pacific ocean perch | 5.40 | 48.65 | 0.13 | 40.62 | 0.23 | 11.56 | 5.76 | 42.95 |
| Rougheye rockfish | 0.07 | 0.63 | 0.02 | 6.25 | 1.38 | 69.35 | 1.47 | 10.96 |
| Sharpchin rockfish | 0.00 | 0.00 | 0.01 | 3.12 | 0.00 | 0.00 | 0.01 | 0.07 |
| Shortraker rockfish | 0.12 | 1.08 | 0.01 | 3.12 | 0.34 | 17.09 | 0.47 | 3.50 |
| Shortspine thornyhead | 3.79 | 34.14 | 0.01 | 3.12 | 0.00 | 0.00 | 3.80 | 28.34 |
| Widow rockfish | 0.06 | 0.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.45 |
| Yelloweye rockfish | 0.29 | 2.61 | 0.03 | 9.38 | 0.00 | 0.00 | 0.32 | 2.39 |
| Yellowtail rockfish | 0.01 | 0.09 | 0.01 | 3.12 | 0.00 | 0.00 | 0.02 | 0.15 |
| Other rockfish ^{2/} | 0.03 | 0.27 | <0.01 | <0.01 | 0.00 | 0.00 | 0.03 | 0.22 |
| Total | 11.10 | | 0.32 | | 1.99 | | 13.41 | |
| Percent by area | 82.77 | | 2.39 | | 14.84 | | | |
| -----Joint venture fisheries----- | | | | | | | | |
| Black rockfish | 5.41 | 2.26 | 0.00 | 0.00 | 0.01 | 0.03 | 5.42 | 1.76 |
| Blue rockfish | 0.20 | 0.08 | <0.01 | <0.01 | 0.00 | 0.00 | 0.20 | 0.07 |
| Darkblotched rockfish | <0.01 | <0.01 | 0.00 | 0.00 | 0.24 | 0.74 | 0.24 | 0.08 |
| Dusky rockfish | 17.70 | 7.40 | 7.18 | 19.85 | 6.68 | 20.73 | 31.56 | 10.26 |
| Harlequin rockfish | 0.17 | 0.07 | <0.01 | <0.01 | 0.20 | 0.62 | 0.37 | 0.12 |
| Northern rockfish | 106.22 | 44.40 | 0.38 | 1.05 | 1.26 | 3.91 | 107.86 | 35.06 |
| Pacific ocean rockfish | 103.53 | 43.27 | 0.44 | 1.22 | 8.24 | 25.57 | 112.21 | 36.47 |
| Rougheye rockfish | 0.02 | 0.01 | 11.26 | 31.12 | 10.80 | 33.51 | 22.08 | 7.18 |
| Sharpchin rockfish | 0.00 | 0.00 | 0.01 | 0.03 | 0.30 | 0.93 | 0.31 | 0.10 |
| Shortraker rockfish | 1.08 | 0.45 | 9.87 | 27.28 | 0.97 | 3.01 | 11.92 | 3.87 |
| Shortspine thornyhead | 2.69 | 1.12 | 6.67 | 18.44 | 3.46 | 10.74 | 12.82 | 4.17 |
| Splitnose rockfish | 1.42 | 0.59 | 0.00 | 0.00 | 0.00 | 0.00 | 1.42 | 0.46 |
| Yelloweye rockfish | 0.58 | 0.24 | 0.36 | 1.00 | 0.02 | 0.06 | 0.96 | 0.31 |
| Other rockfish ^{2/} | 0.22 | 0.09 | 0.01 | 0.09 | 0.05 | 0.48 | 0.28 | 0.09 |
| Total | 239.24 | | 36.18 | | 32.23 | | 307.65 | |
| Percent by area | 77.76 | | 11.76 | | 10.48 | | | |

1/ There was no foreign or joint venture fishing in the Yakutat or Southeastern areas.

2/ Species identified in this category are listed in Table C19.

Table C21 .--Common and scientific names of the flatfish identified in the 1985 foreign and joint venture catches in the Gulf of Alaska.

| Common name | Scientific name |
|------------------------|--|
| Alaska plaice | <u>Pleuronectes quadrituberculatus</u> |
| Arrowtooth flounder | <u>Atheresthes stomias</u> |
| Butter Sole | <u>Isopsetta isolepis</u> |
| Curlfin sole | <u>Pleuronichthys decurrens</u> |
| Deepsea Sole | <u>Embassichthys bathybius</u> |
| Dover Sole | <u>Microstomus pacificus</u> |
| English sole | <u>Parophrys vetulus</u> |
| Flathead sole | <u>Hippoglossoides elassodon</u> |
| Greenland turbot | <u>Reinhardtius hippoglossoides</u> |
| Kamchatka flounder | <u>Atheresthes evermanni</u> |
| Longhead dab | <u>Limanda proboscidea</u> |
| Petrable sole | <u>Eopsetta jordani</u> |
| Rex Sole | <u>Glyptocephalus zachirus</u> |
| Rock sole | <u>Lepidopsetta bilineata</u> |
| Roughscale sole | <u>Clidoderma asperimum</u> |
| Sand sole | <u>Psettichthys melanostictus</u> |
| Sanddab - unidentified | <u>Bothidae</u> |
| Starry flounder | <u>Platichthys stellatus</u> |
| Yellowfin sole | <u>Limanda aspera</u> |

Table C22.--Estimated catch of flatfish by species and area in the Gulf of Alaska during 1985.*

| Common name | Shumagin | | Chirikof | | Kodiak | | Total | |
|--------------------------------------|----------|-------|----------|-------|---------|-------|---------|-------|
| | t | % | t | % | t | % | t | % |
| -----Foreign directed fisheries----- | | | | | | | | |
| Alaska plaice | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Arrowtooth flounder | 90.33 | 78.52 | 42.77 | 78.52 | 0.45 | 97.83 | 133.55 | 78.57 |
| Butter sole | 0.42 | 0.37 | 0.20 | 0.37 | 0.00 | 0.00 | 0.62 | 0.36 |
| Curlfin sole | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Deepsea sole | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dover sole | 0.92 | 0.80 | 0.44 | 0.80 | 0.00 | 0.00 | 1.36 | 0.80 |
| English sole | <0.01 | <0.01 | <0.01 | <0.01 | 0.00 | 0.00 | <0.01 | <0.01 |
| Flathead sole | 5.88 | 5.11 | 2.78 | 5.11 | 0.01 | 2.17 | 8.67 | 5.10 |
| Greenland turbot | 0.09 | 0.08 | 0.04 | 0.08 | 0.00 | 0.00 | 0.13 | 0.08 |
| Kamchatka flounder | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Longhead dab | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Petrable sole | 0.49 | 0.43 | 0.23 | 0.43 | 0.00 | 0.00 | 0.72 | 0.42 |
| Rex sole | 5.19 | 4.51 | 2.46 | 4.51 | 0.00 | 0.00 | 7.65 | 4.50 |
| Rock sole | 11.25 | 9.78 | 5.33 | 9.78 | 0.00 | 0.00 | 16.58 | 9.75 |
| Roughscale sole | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Sand sole | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Sanddab - unidentified | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Starry flounder | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Yellowfin sole | 0.47 | 0.41 | 0.22 | 0.41 | 0.00 | 0.00 | 0.69 | 0.41 |
| Total | 115.04 | | 54.47 | | 0.46 | | 169.97 | |
| Percent by area | 67.68 | | 32.05 | | 0.27 | | | |
| -----Joint venture fisheries----- | | | | | | | | |
| Alaska plaice | 0.00 | 0.00 | 5.09 | 0.89 | 2.02 | 0.13 | 7.11 | 0.29 |
| Arrowtooth flounder | 230.21 | 71.01 | 473.61 | 83.11 | 1150.95 | 74.11 | 1854.77 | 75.80 |
| Butter sole | 0.00 | 0.00 | 0.01 | <0.01 | 7.52 | 0.48 | 7.53 | 0.31 |
| Curlfin sole | 0.00 | 0.00 | 0.03 | 0.01 | 0.00 | 0.00 | 0.03 | <0.01 |
| Deepsea sole | 0.00 | 0.00 | 0.00 | 0.00 | 3.24 | 0.21 | 3.24 | 0.13 |
| Dover sole | 0.10 | 0.03 | 9.55 | 1.68 | 31.59 | 2.03 | 41.24 | 1.69 |
| English sole | 0.00 | 0.00 | 0.32 | 0.06 | 4.97 | 0.32 | 5.29 | 0.22 |
| Flathead sole | 16.21 | 5.00 | 31.10 | 5.46 | 210.15 | 13.53 | 257.46 | 10.52 |
| Greenland turbot | 0.00 | 0.00 | 0.25 | 0.04 | 0.20 | 0.01 | 0.45 | 0.02 |
| Kamchatka flounder | 0.26 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.01 |
| Longhead dab | 0.12 | 0.04 | 0.46 | 0.08 | 0.00 | 0.00 | 0.58 | 0.02 |
| Petrable sole | 0.00 | 0.00 | 0.12 | 0.02 | 0.04 | 0.00 | 0.16 | 0.01 |
| Rex sole | 29.14 | 8.99 | 30.68 | 5.38 | 37.98 | 2.45 | 97.80 | 4.00 |
| Rock sole | 45.69 | 14.09 | 17.61 | 3.09 | 86.76 | 5.59 | 150.06 | 6.13 |
| Roughscale sole | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.06 | <0.01 |
| Sand sole | 0.00 | 0.00 | 0.04 | 0.01 | 6.90 | 0.44 | 6.94 | 0.28 |
| Sanddab - unidentified | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.01 | 0.09 | <0.01 |
| Starry flounder | 0.00 | 0.00 | 0.60 | 0.11 | 6.13 | 0.39 | 6.73 | 0.28 |
| Yellowfin sole | 2.47 | 0.76 | 0.37 | 0.06 | 4.44 | 0.29 | 7.28 | 0.30 |
| Total | 324.20 | | 569.84 | | 1553.04 | | 2447.08 | |
| Percent by area | 13.25 | | 23.29 | | 63.47 | | | |

*There was no foreign or joint venture fishing in the Yakutat or Southeastern areas.

D. SUMMARY OF OBSERVER SAMPLING OFF THE COASTS OF
WASHINGTON, OREGON, AND CALIFORNIA

OBSERVER COVERAGE OF FISHING FLEETS

Joint venture fishing operations for Pacific whiting off the Washington-Oregon-California (WOC) coast (Fig. D1) in 1985 occurred between May 29 and October 8, and were conducted by U.S. fishermen and processing vessels from Poland and the U.S.S.R. (See Table A1 in the introduction section for the definition of a joint venture mothership). Foreign fishing operations for Pacific whiting were performed by Polish large freezer trawlers from June 1 to October 31. In the joint venture fishery, the observer sampling effort of 658 days accounted for 93% of the total joint venture vessel effort of 710 days expended in the WOC region in 1985 (Table D1). This represents a small increase over the level of coverage in 1984 (90%). In the foreign fishery, observers sampled 1,119 days out of a possible 1,172 days (95.5%) in 1985. In 1984, observers sampled 93% of the foreign fishing days.

ESTIMATES OF FOREIGN AND U.S. JOINT VENTURE CATCHES

Within the fisheries for Pacific whiting, the total allowable level of foreign fishing (quota) was set for Pacific whiting. Catches of other species were limited to a percentage of the Pacific whiting quota. The percentages assigned to these other species in 1985 were as follows:

| <u>Species</u> | <u>Percentage of Pacific whiting quota</u> |
|---|--|
| Flounders | 0.1 |
| Jack mackerel | 3.0 |
| Pacific ocean perch | 0.062 |
| Rockfishes (excluding Pacific ocean perch) | 0.738 |
| Sablefish | 0.173 |
| Other species | 0.500 |

For the joint venture fishery, the above percentage limitations were placed on the retention of species other than Pacific whiting and were applied to each 5,000 t of Pacific whiting received in the exclusive economic zone (EEZ) from U.S. vessels. If the retention limit of a species was reached prior to the foreign nations receipt of 5,000 t of Pacific whiting, additional catches of that species were required to be discarded until 5,000 t of Pacific whiting were received and an additional 5,000 t allocation of Pacific whiting was authorized. The percentage limitation on retention of a species applied to each succeeding 5,000 t of Pacific whiting received. The reason for retention limits was the desire by U.S. fishery managers to maintain some control over the by-catch of other important commercial groundfish species taken in the Pacific whiting joint venture.

Approximately 82,232 t of groundfish were landed in 1985 in the foreign and joint venture Pacific whiting fishery (Table D2). About 99% or 81,545 t of the catch was Pacific whiting. Polish vessels fishing on a foreign allocation harvested 49,853 t of whiting, and the joint venture fisheries landed 31,692 t of whiting. The total catch of Pacific whiting by the foreign fishery in 1985 was 3.4 times larger than that of 1984; whereas, the catch by joint venture fisheries in 1985 was 60% less than the catch of Pacific whiting made in 1984 (Berger et al., 1985). Since the implementation of the MFCMA in 1977, the annual catch of Pacific whiting by the foreign fishery had decreased from 127,000 t in 1977 to no catch at all in 1983 (Table D3). In 1984 foreign fishing resumed, and in 1985 it once again exceeded the joint venture catch. In contrast, the joint venture fishery continued to grow during this same period, increasing from a catch of 856 t in 1978 to peak in 1984 with a catch of 78,900 t, and then decrease to 31,700 t in 1985. The decrease in joint venture catch of Pacific whiting in 1985 resulted from a reduction in the size of the amount of Pacific whiting the U.S.S.R. contracted to purchase from U.S. fishermen. In both the foreign and joint venture fisheries, the group of rockfish (excluding Pacific ocean perch) and the species complex classified as "other fish" composed the highest portions of catch other than Pacific whiting. The majority of the by-catch taken in the joint venture fishery was discarded from the processing vessels.

INCIDENCE AND INCIDENTAL CATCH OF PROHIBITED SPECIES

Pacific Salmon and Steelhead

The incidence and average weights of salmon taken in the Pacific whiting fishery in 1985 are shown in Table D4 by nation, statistical area, and month. The highest incidence of salmon occurred in the U.S.-Poland joint venture in May in the Columbia area where the incidence of salmon averaged 0.292 fish/t for the month. The other monthly incidence rate exceeding 0.1 fish/t was observed aboard Polish joint venture vessels in the Vancouver area in August (0.116). The overall incidence of salmon in 1985 was 74% lower than that observed in 1984 (0.028 fish/t vs. 0.108 fish/t).

A summary by 1/2° latitude and 1° longitude blocks of the incidence of salmon in the 1985 Pacific whiting fishery (Fig. D2) shows that the highest incidence of salmon occurred in the fishery conducted in an area off the Olympic Peninsula (47°00' to 48°00' N lat.). This area also had a high incidence of salmon in 1981-84 (Berger et al., 1985), but the incidence rates observed in 1985 were lower than in previous years.

The total estimated incidental catch of salmon in the Pacific whiting fishery in 1985 was 2,288 fish or 7.8 t (Table D5). This was the lowest salmon by-catch since the inception of the MFCMA in 1977 (Table D6). Sixty-two percent of the incidental catch in 1985 occurred during July and August in the Columbia and Vancouver areas. In 1984, 88% of the incidental salmon catch occurred in the same areas and time period.

In the foreign fishery, five species of salmon were caught. Chinook salmon composed 84.0% of the incidental catch and had an average fork length of 70.4 cm (Table D7). Coho salmon averaging 68.0 cm in fork length accounted

for 9.8% of the catch. Chum salmon (58.8 cm average length) made up 4.7% of the catch, and sockeye salmon (0.85%) and pink salmon (0.55%) accounted for the remainder. In the joint venture fishery, five species of salmon also occurred. Chinook salmon made up 76.8% of the incidental catch and had an average fork length of 55.3 cm. Coho salmon averaged 64.1 cm and accounted for 16.7% of the incidental salmon catch. The remaining incidental salmon catch was composed of chum salmon (3.1%), pink salmon (3.0%), and sockeye salmon (0.5%).

There were no steelhead observed in the Pacific whiting fishery in 1985.

Pacific Halibut

As in previous years, the incidence of halibut in the 1985 Pacific whiting fishery was extremely low. Halibut were only observed in catches made in the Columbia and Vancouver INPFC areas (Table D8). The incidence of halibut in the Vancouver area ranged from 0 fish/t to 0.007 fish/t. In the Columbia area, the incidence rate ranged from 0 fish/t to 0.005 fish/t. The total estimated incidental catch of halibut in 1985 was 35 fish, or 0.3 t (Table D9).

ROCKFISH CATCH BY SPECIES

In 1985, a total of about 475 t of rockfish were taken by the foreign and joint venture fisheries targetting on Pacific whiting in the Washington-Oregon-California region (Table D10). (This total includes catches of rockfish retained and discarded in the joint venture fishery.) Thirteen percent of the rockfish catch occurred in the Vancouver area, 87% occurred in the Columbia area, and 0.03% was taken in the Eureka area.

Observers identified 31 species of rockfish in catches landed in the foreign and joint venture Pacific whiting fisheries in 1985 (Table D11). The catch of widow rockfish composed 44% of the overall rockfish catch and catches of yellowtail rockfish composed 43% of the rockfish catch. Yellowtail rockfish was the dominant rockfish species caught in the Vancouver area; widow rockfish dominated the rockfish catch in the Columbia area. Other rockfish species of importance in the Pacific whiting fishery were darkblotched rockfish (3.2%), Pacific ocean perch (2.5%), canary rockfish (1.7%), black rockfish (1.4%), and splitnose rockfish (1.1%).

FLATFISH CATCH BY SPECIES

Approximately 1.4 t of flatfish were caught in the foreign fishery for Pacific whiting, and 0.6 t were caught in the joint venture fishery. Twenty-nine percent of the total flatfish catch occurred in the Vancouver area, 71% occurred in the Columbia area. There was no flatfish catch reported in the Eureka area. The primary species of flatfish identified in the catch were rex sole, arrowtooth flounder and Dover sole. These species accounted for 74.1%, 20.8%, and 4.1% of the catch, respectively.

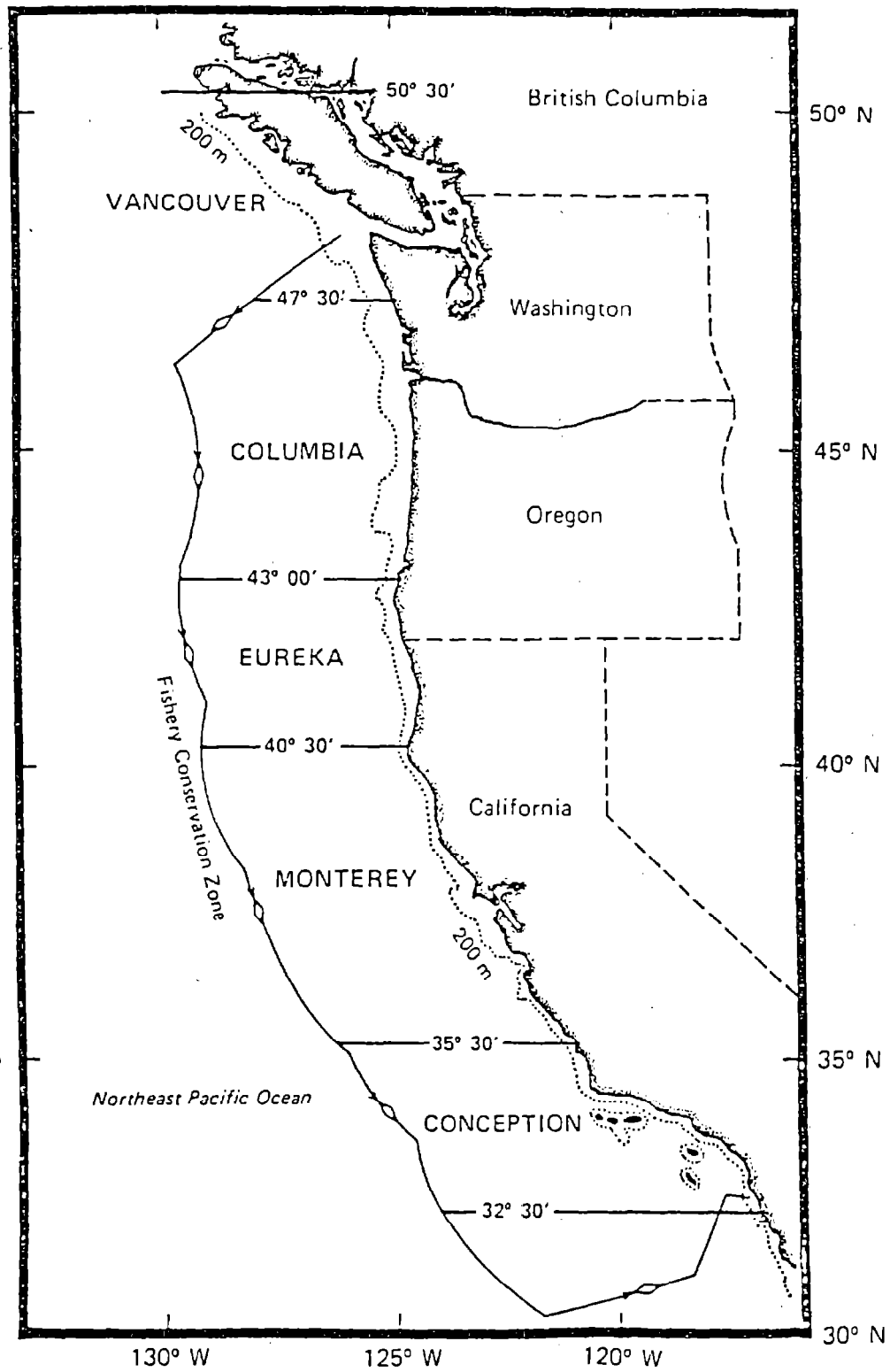


Figure D1.--U.S. statistical areas in the Washington-Oregon-California region used to summarize catch and effort data.

Table D2.--The estimated catches of groundfish taken by foreign and joint venture vessels operating in the Pacific whiting fishery off Washington, Oregon, and California, 1985.

| Species group | Poland ^{1/} | | Joint-venture fishery ^{2/} | | | All fisheries | |
|--|----------------------|-------------------|-------------------------------------|---------------|-----------|-------------------|-----------|
| | Catch (t) | Whiting quota (%) | Retained (t) | Discarded (t) | Total (t) | Whiting catch (%) | Total (t) |
| Pacific whiting | 49,853.2 | -- | 31,691.9 | -- | 31,691.9 | -- | 81,545.1 |
| Jack mackerel | 35.7 | 0.07 | 0.1 | 1.8 | 1.9 | 0.01 | 37.6 |
| Rockfish (excluding Pacific ocean perch) | 169.4 | 0.31 | 48.6 | 245.2 | 293.8 | 0.93 | 463.2 |
| Pacific ocean perch | 10.4 | 0.02 | <0.1 | 1.4 | 1.4 | <0.01 | 11.8 |
| Sablefish | 23.7 | 0.04 | 1.0 | 2.6 | 3.6 | 0.01 | 27.3 |
| Flounders | 1.4 | <0.01 | 0.1 | 0.5 | 0.6 | <0.01 | 2.0 |
| Other fish | 105.3 | 0.20 | 5.4 | 34.5 | 39.9 | 0.13 | 145.2 |
| TOTAL | 50,199.2 | | 31,747.1 | 286.0 | 32,033.1 | | 82,232.3 |

1/ The Pacific whiting quota in 1985 was 54,000 t. for Poland. See text description of by-catch levels in relation to the Pacific whiting quota.

2/ See text for description of regulations pertaining to retention and discarding of joint venture catch.

Table D3.--Estimated catch of Pacific whiting by foreign and joint venture fisheries off Washington, Oregon, and California, 1977-85^{1/}.

| Fishery | 1977 t | 1978 t | 1979 t | 1980 t | 1981 t | 1982 t | 1983 t | 1984 t | 1985 t |
|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Foreign | 127,013 | 93,332 | 114,910 | 44,023 | 70,365 | 7,089 | NF | 14,772 | 49,853 |
| Joint venture | NF | 856 | 8,834 | 27,537 | 43,557 | 67,465 | 72,100 | 78,889 | 31,692 |
| TOTAL | 127,013 | 94,188 | 123,744 | 71,560 | 113,922 | 74,554 | 72,100 | 93,661 | 81,545 |

^{1/} Berger et al. (1985) for 1977-84.

NF = No fishing

Table D4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches on the Pacific Coast, 1985.

| | Vancouver | | Columbia | | Eureka | | Monterey | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average Weight | Incidence | Average Weight | Incidence | Average Weight | Incidence | Average Weight |
| -----Polish Large Freezer Trawler----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | NS | NS | -- | -- | -- | -- |
| JUNE | -- | -- | 0.001 | 4.633 | -- | -- | -- | -- |
| JULY | -- | -- | 0.006 | 7.018 | 0.005 | 3.270 | -- | -- |
| AUG. | -- | -- | 0.003 | 5.633 | 0.002 | 2.799 | -- | -- |
| SEPT. | -- | -- | 0.032 | 5.341 | 0.000 | 0.000 | -- | -- |
| OCT. | -- | -- | 0.023 | 5.188 | 0.000 | 0.000 | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | -- | -- | 0.016 | 5.374 | 0.004 | 3.213 | -- | -- |
| -----U.S.-U.S.S.R. JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | 0.011 | 2.680 | -- | -- | -- | -- |
| JULY | 0.084 | 3.048 | 0.084 | 2.473 | -- | -- | -- | -- |
| AUG. | 0.055 | 2.410 | 0.048 | 2.526 | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.075 | 2.905 | 0.048 | 2.505 | -- | -- | -- | -- |

NS = Fishing occurred but no sampling by U.S. observers.

Table D4.--Incidence (number per metric ton of catch) and average weight (kg) of salmon taken in the foreign and joint venture groundfish catches on the Pacific Coast, 1985 (Continued).
Lines indicate areas not fished.

| | Vancouver | | Columbia | | Eureka | | Monterey | |
|-------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average Weight | Incidence | Average Weight | Incidence | Average Weight | Incidence | Average Weight |
| -----U.S.-Poland JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | 0.292 | 1.700 | -- | -- | -- | -- |
| JUNE | -- | -- | 0.047 | 1.856 | -- | -- | -- | -- |
| JULY | 0.015 | 2.560 | 0.032 | 2.488 | -- | -- | -- | -- |
| AUG. | 0.116 | 2.506 | 0.055 | 2.225 | -- | -- | -- | -- |
| SEPT. | -- | -- | 0.014 | 6.633 | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.098 | 2.506 | 0.038 | 2.471 | -- | -- | -- | -- |

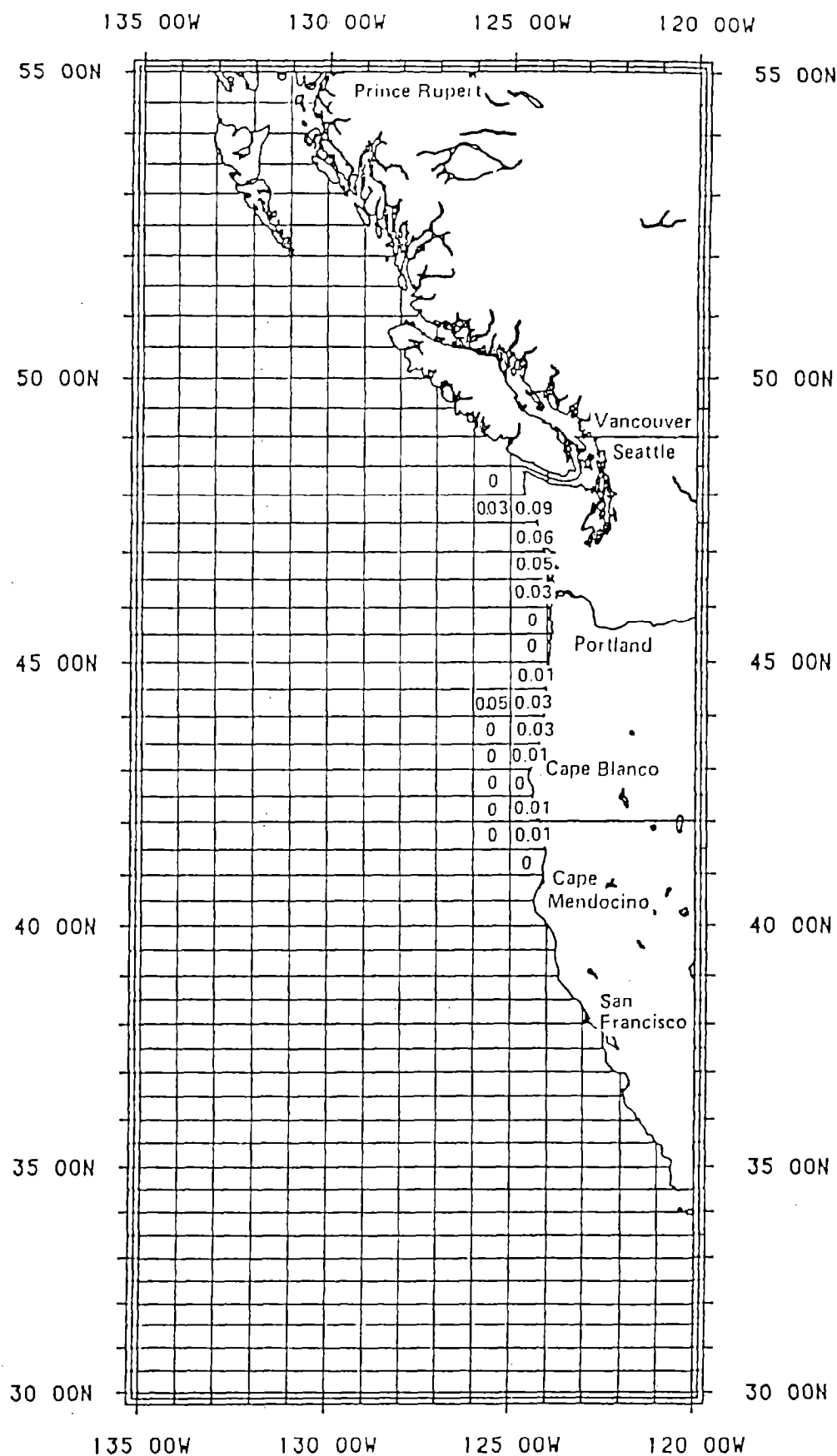


Figure D2. --Average incidence of salmon (no. of salmon/t of groundfish) in the joint venture Pacific whiting fishery off Washington, Oregon, and California, 1985.

Table D5.--Estimated incidental catch of salmon (numbers and tons) in the foreign and joint venture Pacific whiting fisheries off Washington, Oregon, and California, 1985.

| Month | Vancouver ^{1/} | | Columbia | | Eureka | | All areas | |
|---|-------------------------|------|----------|------|--------|------|-----------|------|
| | Nos. | t | Nos. | t | Nos. | t | Nos. | t |
| -----Foreign fishery--Poland----- | | | | | | | | |
| May | -- | -- | 0 | 0.0 | -- | -- | 0 | 0.0 |
| June | -- | -- | 4 | <0.1 | -- | -- | 4 | <0.1 |
| July | -- | -- | 30 | 0.2 | 25 | 0.1 | 55 | 0.3 |
| August | -- | -- | 41 | 0.2 | 1 | <0.1 | 42 | 0.2 |
| September | -- | -- | 365 | 2.0 | 0 | 0.0 | 365 | 2.0 |
| October | -- | -- | 247 | 1.3 | 0 | 0.0 | 247 | 1.3 |
| TOTAL | -- | -- | 687 | 3.7 | 26 | 0.1 | 713 | 3.8 |
| -----Joint-venture fishery--U.S.--Poland----- | | | | | | | | |
| May | -- | -- | 29 | 0.1 | -- | -- | 29 | 0.1 |
| June | -- | -- | 135 | 0.3 | -- | -- | 135 | 0.3 |
| July | 20 | 0.1 | 245 | 0.6 | -- | -- | 265 | 0.7 |
| August | 296 | 0.7 | 191 | 0.4 | -- | -- | 487 | 1.1 |
| September | -- | -- | 31 | 0.2 | -- | -- | 31 | 0.2 |
| October | 0 | 0.0 | 0 | 0.0 | -- | -- | 0 | 0.0 |
| TOTAL | 316 | 0.8 | 631 | 1.6 | -- | -- | 947 | 2.4 |
| -----Joint-venture fishery--U.S.--U.S.S.R.----- | | | | | | | | |
| June | -- | -- | 42 | 0.1 | -- | -- | 42 | 0.1 |
| July | 231 | 0.7 | 251 | 0.6 | -- | -- | 482 | 1.3 |
| August | 8 | <0.1 | 96 | 0.2 | -- | -- | 104 | 0.2 |
| TOTAL | 239 | 0.7 | 389 | 0.9 | -- | -- | 628 | 1.6 |
| -----All fisheries--TOTAL----- | | | | | | | | |
| May | -- | -- | 29 | 0.1 | -- | -- | 29 | 0.1 |
| June | -- | -- | 181 | 0.4 | -- | -- | 181 | 0.4 |
| July | 251 | 0.8 | 526 | 1.4 | 25 | 0.1 | 802 | 2.3 |
| August | 304 | 0.7 | 328 | 0.8 | 1 | <0.1 | 633 | 1.5 |
| September | -- | -- | 396 | 2.2 | 0 | 0.0 | 396 | 2.2 |
| October | 0 | 0.0 | 247 | 1.3 | 0 | 0.0 | 247 | 1.3 |
| TOTAL | 555 | 1.5 | 1,707 | 6.2 | 26 | 0.1 | 2,288 | 7.8 |

^{1/} The foreign fishery is prohibited from fishing in the Vancouver area.

Table D6.--Estimated catch of salmon (numbers) in the foreign and joint venture Pacific whiting fishery off Washington, Oregon, and California, 1977-85^{1/}.

| Area/year | Foreign fishery | | | | Joint venture fishery | | | | | Grand total |
|-------------------------------|-----------------|-----------|-------------|---------------|-----------------------|--------------|----------------|------------------|----------------|---------------|
| | Total Nos. | USSR Nos. | Poland Nos. | Bulgaria Nos. | Total Nos. | US-USSR Nos. | US-Poland Nos. | US-Bulgaria Nos. | US-Greece Nos. | All fisheries |
| Vancouver^{2/} | | | | | | | | | | |
| 1977 | | | | | | | | | | |
| 1978 | | | | | | | | | | |
| 1979 | | | | | | | | | | |
| 1980 | | | | | 356 | 356 | | | | 356 |
| 1981 | | | | | 752 | 752 | | | | 752 |
| 1982 | | | | | 3,144 | 2,465 | | 679 | | 3,144 |
| 1983 | | | | | 2,235 | 2,235 | | | | 2,235 |
| 1984 | | | | | 3,702 | 2,546 | 1,156 | | | 3,702 |
| 1985 | | | | | 555 | 239 | 316 | | | 555 |
| Columbia | | | | | | | | | | |
| 1977 | 11,896 | 10,727 | 1,169 | | | | | | | 11,896 |
| 1978 | 5,236 | 2,534 | 2,702 | | 19 | 19 | | | | 5,255 |
| 1979 | 6,361 | 5,860 | 501 | | 1,623 | 1,623 | | | | 7,984 |
| 1980 | 4,815 | | 4,815 | | 1,382 | 1,370 | 12 | | | 6,197 |
| 1981 | 2,357 | | 2,289 | 68 | 444 | 373 | 0 | 71 | | 2,801 |
| 1982 | 102 | | | 102 | 2,434 | 2,036 | | 398 | | 2,536 |
| 1983 | | | | | 2,221 | 2,221 | | | | 2,221 |
| 1984 | 52 | 16 | 36 | | 5,966 | 4,661 | 1,305 | | | 6,018 |
| 1985 | 687 | | 687 | | 1,020 | 389 | 631 | | | 1,707 |
| Eureka | | | | | | | | | | |
| 1977 | 2,731 | 2,461 | 270 | | | | | | | 2,731 |
| 1978 | 669 | 347 | 322 | | | | | | | 669 |
| 1979 | 682 | 529 | 153 | | | | | | | 682 |
| 1980 | 16 | | 16 | | 1,864 | 1,853 | 11 | | | 1,880 |
| 1981 | 2,704 | | 2,545 | 150 | 5,226 | 4,844 | 295 | 67 | 20 | 7,930 |
| 1982 | 2 | | | 2 | 6,116 | 5,996 | | 120 | | 6,118 |
| 1983 | | | | | 612 | 612 | | | | 612 |
| 1984 | 11 | 11 | | | 523 | 523 | | | | 534 |
| 1985 | 26 | | 26 | | | | | | | 26 |
| Monterey | | | | | | | | | | |
| 1977 | 0 | 0 | 0 | | | | | | | 0 |
| 1978 | 0 | 0 | 0 | | | | | | | 0 |
| 1979 | | | | | | | | | | |
| 1980 | | | | | | | | | | |
| 1981 | 0 | | 0 | | | | | | | 0 |
| 1982 | | | | | 0 | 0 | | | | 0 |
| 1983 | | | | | 75 | 75 | | | | 75 |
| 1984 | | | | | 1 | 1 | | | | 1 |
| 1985 | | | | | | | | | | |
| TOTAL | | | | | | | | | | |
| 1977 | 14,627 | 13,088 | 1,439 | | | | | | | 14,627 |
| 1978 | 5,905 | 2,881 | 3,024 | | 19 | 19 | | | | 5,924 |
| 1979 | 7,043 | 6,389 | 654 | | 1,623 | 1,623 | | | | 8,666 |
| 1980 | 4,831 | | 4,831 | | 3,602 | 3,579 | 23 | | | 8,433 |
| 1981 | 5,052 | | 4,834 | 218 | 6,422 | 5,969 | 295 | 138 | 20 | 11,474 |
| 1982 | 104 | | | 104 | 11,694 | 10,497 | | 1,197 | | 11,798 |
| 1983 | | | | | 5,143 | 5,143 | | | | 5,143 |
| 1984 | 63 | 27 | 36 | | 10,192 | 7,731 | 2,461 | | | 10,255 |
| 1985 | 713 | | 713 | | 1,575 | 628 | 947 | | | 2,288 |

1/ Berger et al. (1985) for 1977-84.

2/ The foreign fishery is prohibited from fishing in the Vancouver area.

Table D7.--Biological data on the incidental catch of Pacific salmon in the foreign and joint venture groundfish fishery off Washington, Oregon, and California, 1985.

| Species | Percent by species | Sex | Sex composition | Average weight (kg) | Average length (cm) |
|--------------------------------------|-----------------------|----------|--------------------|------------------------|------------------------|
| -----Foreign directed fisheries----- | | | | | |
| Chinook | 84.03 | Male | 42.85 | 5.47 | 70.9 |
| | | Female | 51.52 | 5.40 | 69.9 |
| | | Unsexed | 5.63 | 6.69 | 72.4 |
| | | Combined | | 5.50 | 70.4 |
| Chum | 4.73 | Male | 34.43 | 3.44 | 61.0 |
| | | Female | 61.14 | 3.04 | 57.7 |
| | | Unsexed | 4.43 | 7.00 | 58.0 |
| | | Combined | | 3.36 | 58.8 |
| Coho | 9.84 | Male | 34.41 | 4.56 | 68.3 |
| | | Female | 45.29 | 4.29 | 67.4 |
| | | Unsexed | 20.30 | 4.68 | 68.8 |
| | | Combined | | 4.46 | 68.0 |
| Sockeye | 0.85 | Male | 73.64 | 4.48 | 67.9 |
| | | Female | 26.36 | 7.48 | 81.0 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 5.27 | 71.4 |
| Pink | 0.55 | Male | 56.88 | 2.81 | 55.5 |
| | | Female | 43.12 | 2.60 | 57.0 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 2.72 | 56.2 |
| -----Joint venture fisheries----- | | | | | |
| Chinook | 76.77 | Male | 49.16 | 2.54 | 54.3 |
| | | Female | 48.66 | 2.63 | 56.7 |
| | | Unsexed | 2.18 | 1.76 | 49.5 |
| | | Combined | | 2.57 | 55.3 |
| Chum | 3.07 | Male | 45.61 | 3.55 | 62.7 |
| | | Female | 54.39 | 3.34 | 65.2 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 3.43 | 64.1 |
| Coho | 16.66 | Male | 48.81 | 2.51 | 56.5 |
| | | Female | 49.83 | 2.48 | 56.5 |
| | | Unsexed | 1.36 | 0.82 | 41.1 |
| | | Combined | | 2.47 | 56.3 |
| Sockeye | 0.54 | Male | 51.19 | 4.02 | 64.6 |
| | | Female | 48.81 | 3.57 | 65.3 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 3.80 | 64.9 |
| Pink | 2.98 | Male | 37.15 | 1.67 | 53.6 |
| | | Female | 62.85 | 2.29 | 54.2 |
| | | Unsexed | 0.00 | -- | -- |
| | | Combined | | 2.06 | 54.0 |

Table D8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches of the Pacific Coast, 1985.
Lines indicate areas not fished.

| | Vancouver | | Columbia | | Eureka | | Monterey | |
|--|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average Weight | Incidence | Average Weight | Incidence | Average Weight | Incidence | Average Weight |
| -----Polish Large Freezer Trawler----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | NS | NS | -- | -- | -- | -- |
| JUNE | -- | -- | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | -- | -- | <0.001 | 1.500 | 0.000 | 0.000 | -- | -- |
| AUG. | -- | -- | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- |
| SEPT. | -- | -- | <0.001 | 65.300 | 0.000 | 0.000 | -- | -- |
| OCT. | -- | -- | <0.001 | 3.500 | 0.000 | 0.000 | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | -- | -- | <0.001 | 23.418 | 0.000 | 0.000 | -- | -- |
| -----U.S.-U.S.S.R. JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | -- | -- | -- | -- | -- | -- |
| JUNE | -- | -- | 0.005 | 3.920 | -- | -- | -- | -- |
| JULY | 0.000 | 0.000 | 0.002 | 5.597 | -- | -- | -- | -- |
| AUG. | 0.007 | 4.612 | 0.000 | 0.000 | -- | -- | -- | -- |
| SEPT. | -- | -- | -- | -- | -- | -- | -- | -- |
| OCT. | -- | -- | -- | -- | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.002 | 4.612 | 0.002 | 4.399 | -- | -- | -- | -- |

NS = Fishing occurred but no sampling by U.S. observers.

Table D8.--Incidence (number per metric ton of catch) and average weight (kg) of Pacific halibut taken in the foreign and joint venture groundfish catches on the Pacific Coast, 1985 (Continued).
Lines indicate areas not fished.

| | Vancouver | | Columbia | | Eureka | | Monterey | |
|-------------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| | Incidence | Average Weight | Incidence | Average Weight | Incidence | Average Weight | Incidence | Average Weight |
| -----U.S.-Poland JV Mothership----- | | | | | | | | |
| JAN. | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB. | -- | -- | -- | -- | -- | -- | -- | -- |
| MARCH | -- | -- | -- | -- | -- | -- | -- | -- |
| APRIL | -- | -- | -- | -- | -- | -- | -- | -- |
| MAY | -- | -- | 0.000 | 0.000 | -- | -- | -- | -- |
| JUNE | -- | -- | 0.000 | 0.000 | -- | -- | -- | -- |
| JULY | 0.000 | 0.000 | <0.001 | 6.951 | -- | -- | -- | -- |
| AUG. | 0.001 | 9.240 | 0.000 | 0.000 | -- | -- | -- | -- |
| SEPT. | -- | -- | 0.001 | 30.310 | -- | -- | -- | -- |
| OCT. | 0.000 | 0.000 | 0.000 | 0.000 | -- | -- | -- | -- |
| NOV. | -- | -- | -- | -- | -- | -- | -- | -- |
| DEC. | -- | -- | -- | -- | -- | -- | -- | -- |
| ANNUAL | 0.001 | 9.240 | <0.001 | 14.744 | -- | -- | -- | -- |

Table D9.--Estimated incidental catch of Pacific halibut (numbers and tons) in the foreign and joint venture Pacific whiting fishery off Washington, Oregon, and California, 1985.

| Month | Vancouver ^{1/} | | Columbia ^{1/} | | Total | |
|---|-------------------------|------|------------------------|------|-------|------|
| | Nos. | t | Nos. | t | Nos. | t |
| -----Foreign fishery--Poland----- | | | | | | |
| May | -- | -- | 0 | 0.0 | 0 | 0.0 |
| June | -- | -- | 0 | 0.0 | 0 | 0.0 |
| July | -- | -- | 1 | <0.1 | 1 | <0.1 |
| August | -- | -- | 0 | 0.0 | 0 | 0.0 |
| September | -- | -- | 1 | 0.1 | 1 | 0.1 |
| October | -- | -- | 2 | <0.1 | 2 | <0.1 |
| TOTAL | -- | -- | 4 | 0.1 | 4 | 0.1 |
| -----Joint venture fishery--U.S.--Poland----- | | | | | | |
| May | -- | -- | 0 | 0.0 | 0 | 0.0 |
| June | -- | -- | 0 | 0.0 | 0 | 0.0 |
| July | 0 | 0.0 | 3 | <0.1 | 3 | <0.1 |
| August | 2 | <0.1 | 0 | 0.0 | 2 | <0.1 |
| September | -- | -- | 1 | <0.1 | 1 | <0.1 |
| October | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| TOTAL | 2 | <0.1 | 4 | 0.1 | 6 | 0.1 |
| -----Joint venture fishery--U.S.--U.S.S.R.----- | | | | | | |
| June | 0 | 0.0 | 18 | 0.1 | 18 | 0.1 |
| July | 0 | 0.0 | 6 | <0.1 | 6 | <0.1 |
| August | 1 | <0.1 | 0 | 0.0 | 1 | <0.1 |
| TOTAL | 1 | <0.1 | 24 | 0.1 | 25 | 0.1 |
| -----All fisheries--TOTAL----- | | | | | | |
| May | -- | -- | 0 | 0.0 | 0 | 0.0 |
| June | 0 | 0.0 | 18 | 0.1 | 18 | 0.1 |
| July | 0 | 0.0 | 10 | 0.1 | 10 | 0.1 |
| August | 3 | <0.1 | 0 | 0.0 | 3 | <0.1 |
| September | -- | -- | 2 | 0.1 | 2 | 0.1 |
| October | 0 | 0.0 | 2 | <0.1 | 2 | <0.1 |
| TOTAL | 3 | <0.1 | 32 | 0.3 | 35 | 0.3 |

^{1/} Halibut were only caught in the Vancouver and Columbia areas.

Table D10.--Estimated catch of rockfish (t) by species in the foreign and joint venture Pacific whiting fishery off Washington, Oregon, and California, 1985.

| Common name | Vancouver | | Columbia | | Eureka | | Total | |
|--------------------------------------|-----------|-------|----------|-------|--------|-------|--------|-------|
| | t | % | t | % | t | % | t | % |
| -----Foreign directed fisheries----- | | | | | | | | |
| Bocaccio | -- | -- | 1.09 | 0.61 | 0.00 | 0.00 | 1.09 | 0.61 |
| Brown rockfish | -- | -- | 1.07 | 0.60 | 0.00 | 0.00 | 1.07 | 0.60 |
| Canary rockfish | -- | -- | 4.54 | 2.53 | 0.00 | 0.00 | 4.54 | 2.52 |
| Darkblotched rockfish | -- | -- | 10.76 | 5.99 | 0.00 | 0.00 | 10.76 | 5.98 |
| Pacific ocean perch | -- | -- | 10.37 | 5.77 | 0.00 | 0.00 | 10.37 | 5.77 |
| Redstripe rockfish | -- | -- | 1.03 | 0.57 | 0.01 | 7.14 | 1.04 | 0.58 |
| Rougheye rockfish | -- | -- | 1.03 | 0.57 | 0.00 | 0.00 | 1.03 | 0.57 |
| Shortraker rockfish | -- | -- | 0.84 | 0.47 | 0.00 | 0.00 | 0.84 | 0.47 |
| Shortspine thornyhead | -- | -- | 1.32 | 0.73 | 0.00 | 0.00 | 1.32 | 0.73 |
| Silvergray rockfish | -- | -- | 0.47 | 0.26 | 0.00 | 0.00 | 0.47 | 0.26 |
| Splitnose rockfish | -- | -- | 5.30 | 2.95 | 0.00 | 0.00 | 5.30 | 2.95 |
| Vermillion rockfish | -- | -- | 0.01 | 0.01 | 0.01 | 7.14 | 0.02 | 0.01 |
| Widow rockfish | -- | -- | 121.96 | 67.88 | 0.12 | 85.71 | 122.08 | 67.89 |
| Yelloweye rockfish | -- | -- | 0.49 | 0.27 | 0.00 | 0.00 | 0.49 | 0.27 |
| Yellowmouth rockfish | -- | -- | 0.43 | 0.24 | 0.00 | 0.00 | 0.43 | 0.24 |
| Yellowtail rockfish | -- | -- | 18.23 | 10.15 | 0.00 | 0.00 | 18.23 | 10.14 |
| Other rockfish* | -- | -- | 0.74 | 0.41 | 0.00 | 0.00 | 0.74 | 0.41 |
| Total | -- | -- | 179.68 | | 0.14 | | 179.82 | |
| Percent by area | -- | -- | 99.92 | | 0.08 | | | |
| -----Joint venture fisheries----- | | | | | | | | |
| Black rockfish | 1.49 | 2.50 | 3.89 | 1.65 | -- | -- | 5.38 | 1.82 |
| Bocaccio | 0.10 | 0.17 | 2.34 | 0.99 | -- | -- | 2.44 | 0.83 |
| Canary rockfish | 1.66 | 2.79 | 1.73 | 0.73 | -- | -- | 3.39 | 1.15 |
| Darkblotched rockfish | 0.00 | 0.00 | 4.55 | 1.93 | -- | -- | 4.55 | 1.54 |
| Greenstriped rockfish | 0.00 | 0.00 | 2.47 | 1.05 | -- | -- | 2.47 | 0.84 |
| Pacific ocean perch | 0.10 | 0.17 | 1.31 | 0.56 | -- | -- | 1.41 | 0.48 |
| Redstripe rockfish | 0.01 | 0.02 | 0.72 | 0.31 | -- | -- | 0.73 | 0.25 |
| Widow rockfish | 7.03 | 11.82 | 81.11 | 34.41 | -- | -- | 88.14 | 29.85 |
| Yellowtail rockfish | 48.89 | 82.18 | 136.77 | 58.01 | -- | -- | 185.66 | 62.88 |
| Other rockfish* | 0.21 | 0.35 | 0.86 | 0.36 | -- | -- | 1.07 | 0.36 |
| Total | 59.49 | | 235.75 | | -- | -- | 295.24 | |
| Percent by area | 20.15 | | 79.85 | | -- | -- | | |

*Species included in this category are listed in Table D11.

Table D11 .--The common and scientific names of rockfish identified in the 1985 foreign and joint venture catches in the Washington-oregon-California Pacific whiting fishery.

| Common name ^{1/} | Scientific name |
|---------------------------|--------------------------------|
| Black rockfish | <u>Sebastes melanops</u> |
| Bocaccio | <u>Sebastes paucispinis</u> |
| Brown rockfish | <u>Sebastes auriculatus</u> |
| Canary rockfish | <u>Sebastes pinniger</u> |
| Darkblotched rockfish | <u>Sebastes crameri</u> |
| Greenstriped rockfish | <u>Sebastes elongatus</u> |
| Pacific ocean perch | <u>Sebastes alutus</u> |
| Redstripe rockfish | <u>Sebastes proriger</u> |
| Rougheye rockfish | <u>Sebastes aleutianus</u> |
| Shortraker rockfish | <u>Sebastes borealis</u> |
| Shortspine thornyhead | <u>Sebastolobus alascanus</u> |
| Silvergray rockfish | <u>Sebastes brevispinis</u> |
| Splitnose rockfish | <u>Sebastes diploproa</u> |
| Vermillion rockfish | <u>Sebastes miniatus</u> |
| Widow rockfish | <u>Sebastes entomelas</u> |
| Yelloweye rockfish | <u>Sebastes ruberrimus</u> |
| Yellowmouth rockfish | <u>Sebastes reedi</u> |
| Yellowtail rockfish | <u>Sebastes flavidus</u> |
| Other rockfish- | |
| Aurora rockfish | <u>Sebastes aurora</u> |
| Blackgill rockfish | <u>Sebastes melanostomus</u> |
| Blue rockfish | <u>Sebastes mvstinus</u> |
| Chilipepper | <u>Sebastes goodei</u> |
| Copper rockfish | <u>Sebastes caurinus</u> |
| Dusky rockfish | <u>Sebastes ciliatus</u> |
| Olive rockfish | <u>Sebastes serranoides</u> |
| Quillback rockfish | <u>Sebastes maliqer</u> |
| Redbanded rockfish | <u>Sebastes babcocki</u> |
| Rosethorn rockfish | <u>Sebastes helvomaculatus</u> |
| Sharpchin rockfish | <u>Sebastes zacentrus</u> |
| Shortbelly rockfish | <u>Sebastes jordani</u> |
| Stripetail rockfish | <u>Sebastes saxicola</u> |

1/- With all rockfish, the possibility of misidentification exists, and the listing of species not previously reported from the Washington-oregon-California region should be noted with caution.

2/- The 13 species listed under "Other rockfish" each made up less than 0.10% of the rockfish catch by foreign or joint venture vessels.

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